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THE

MORBID ANATOMY

OF THE

HUMAN GULLET, STOMACH,

AND

INTESTINES.

BY

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&c. &c. &c.

Utinam liceret sæpius defunctorum cadavera scrutari! quot non detegerentur latentes morborum causæ. Celsus.

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AND TO

Mr ALLAN BURNS,

SURGEON, AND TEACHER OF ANATOMY AND SURGERY IN GLASGOW;

The FRIENDS whose countenance and co-operation have encouraged the present undertaking, and whose labours have contributed so largely to the advancement of Morbid Anatomy, this Volume is dedicated, with respect and gratitude, by the

AUTHOR.

Edinburgh, Nov. 4. 1811.

TABLE OF CONTENTS.

	Page
Introduction	
General Observations upon the Structure and Morbid Anatomy of the Alimentary Canal	1
Of extraneous Bodies lodged within different parts of the Alimentary Canal, and of their effects	14
Of Obstruction of the Alimentary Canal, occasioned by Alvine Concretions	25
Of Calculi in the Tonsils	74
Of the effects of Arsenic	79
Of the effects of Opium or its Tincture	92
Of the means of counteracting the effects of Opium	96
Of the effects of the concentrated Mineral Acids	104
Of organic derangements of the Villous Coat	212
Of Inflammation of the Villous Coat of the Alimentary Canal	112
Of Inflammation of the Villous Coat of the Gullet	113
of the Villous Coat of the Stomach	115
of the Intestines	116
Of thickening of the Villous Coat	119
Of Ulceration and erosion of the Villous Coat	125
Of Gangrene of the Villous Coat	128
Of Dysentery	152
Of the milt-like Tumour of Mucous Membranes	160

Page

Of Polypi - - - - 181
Of Polypi of the Pharynx - - - 184
of the Gullet - - - 186
of the Stomach - - - 189
of the Intestines - - - 192
Of Fatty or Steatomatous Tumours - - 196
Of Fungus of the Villous Coat - - 197
Of Hæmorrhoids - - - 202
Of Varicose Tumours - - - 203
Of Stricture occasioned by a transverse fold of the Villous Coat - - - - 205
Of Aphthæ - - - - 207
Of Small-Pox Pustules within the Alimentary Canal 209
Of the deposition of Cartilage and Bone upon the Villous Coat - - - ib.
Of Organic Derangements of the Cellular Coat - 212
Of Inflammation and Suppuration in the Cellular Coat of the Alimentary Canal - - - ib.
Of the deposition of Albuminous Matter in the Cellular Coat of the Alimentary Canal - - 217
Of Spasm of the Gullet - - - 223
Of Palsy of the Gullet - - - 229
Of Spasmodic contraction of the Stomach - 236
Of Palsy of the Stomach - - - 243
Of Spasmodic contraction of the Intestines - 244
Of Organic Derangements of the Peritoneal Coat - 248
Of Inflammation of the Peritoneal Coat - - 249
Of Tumours growing from the Peritoneal Coat - 253
Of Ossification of the Peritoneum - - 254
Of Hydatids - - - - 255
Of Organic Derangements of all the Coats of the Alimentary Canal - - - 291
Of Stricture - - - 291
Of the double permanent Stricture - - 300
Of Scrofula of the Alimentary Canal - 302

Page

Of the Coats of the Alimentary Canal reduced to a Pulpy state - - - - 305
Of Induration of the Coats of the Alimentary Canal 310
Of Dilatation of the Alimentary Canal - 311
Of Rupture of the Alimentary Canal - ib.
Of the Organic diseases of the Mucous Glands of the Alimentary Canal - - - 320
Of Scirrhus and Cancer of the Gullet - - 325
of the Stomach - 328
of the Intestines - 343
Of the enlargement of the Mucous Glands - 352
Of Intus-susceptio - - - 354
Of the Double Intus-susceptio - - *354
Of Procidentia Ani - - - 363
Of Hernia - - - ib.
General Observations on Hernia - - 364
Of the Anatomy of the parts concerned in Hernia - 412
Of Inguinal Herniæ - - - 459
Of Crural Herniæ - - 477
Of Umbilical Herniæ - - 504
Of Congenital Herniæ - - 508
Of Ventral Herniæ - - 518
Of Hernia of the Bladder of Urine - - 521
Of Ischiatic Herniæ - - 528
Of Hernia Obturatoria - - 529
Of Perineal Herniæ - - ib.
Of Vaginal Herniæ - - - 531
Of Pudendal Intestinal Herniæ - - 532
Of Herniæ occasioned by the unnatural elongation of the Omentum - - - 533
Of Mesenteric Herniæ - - 537
Of Diaphragmatic Herniæ - - 539
Of Malconformation of the lower part of the Alimentary Canal - - - 542
Of Worms of the Alimentary Canal - 549
Conclusion - - - 563

THE

MORBID ANATOMY

OF THE

HUMAN GULLET, STOMACH,

AND

INTESTINES.

INTRODUCTION.

It is the object of Morbid Anatomy to classify and to explain all deviations from the healthy structure, and the symptoms connected with organic derangements.

The importance of the study of Morbid Anatomy to the accurate knowledge of Physic and Surgery, must be obvious even to the cursory and inexperienced inquirer. It may, indeed, be represented as one of the primary foundations of Medical Science; for without an intimate acquaintance with the morbid changes that take place in the human frame, as the causes or the effects of disease, the practice of Physic and Surgery can be directed only by ill-founded hypotheses or blind empiricism. "Et quis denique," says Dr Sandifort*, "vel ipsius Hippocratis aurea scripta attento volvens animo, non animadvertit sæpius summum hunc naturæ observato-

* Vid. Oratio de circumspecto Cadav. examine optim. Pract. Med. adminic.

rem longe plures sanaturum fuisse morbos, si cultri ope illorum inquirere causas ipsi fuisset concessum." He adds, under the influence of the same strong impression, "Revera enim in permultis casibus causa morbi inventa, inventam etiam esse sanationem, et plurimos ab hostili morborum insultu esse liberatos."

The diseases incident to the Human Frame may be divided into two great classes: the First comprehending those which proceed from some evident derangement of the organic structure, and the Second, such as originate in some derangement of the functions of the part affected.

As the former class is by far the more numerous, the study of Morbid Anatomy is one of the principal sources from which the knowledge of the nature of diseases may be obtained; and it has contributed to raise the different branches of medicine from their original state of rudeness and imperfection.

The science of Medicine was anciently very imperfect, and it made, during many ages, but little progress; for the success of medical investigations has not corresponded to the genius or industry of those who pursued them, because some fundamental assumption was made, which ought first to have been patiently ascertained, and little or no attention was paid to the dissection of Morbid Bodies: And it is surely a matter of regret, that a subject abounding with so much useful instruction, should not sooner have attracted the notice of enlightened and ingenious men, and should not have

been cultivated with the same zeal and success as many other branches of philosophy.

There are many advantages which are peculiar to the study of MORBID ANATOMY, which it may not be improper to enumerate.

In the 1st place, this study, by elucidating the nature and progress of diseases connected with a derangement in the Organic Structure, affords a sure foundation upon which an opinion may be grounded, respecting the nature and progress of such diseases.

2d, As this study proves, that parts similar in their structure are subject to the same organic derangements, it exposes the fallacy of many hypotheses which have been propagated respecting organic diseases.

3d, If parts of a similar structure be subject to similar organic derangements, MORBID ANATOMY may tend to unfold the structure of many of the smaller parts of the human body, which have hitherto escaped observation, as it shews that many of these smaller parts are subject to the same organic derangements as those organs whose structure is obvious to our unassisted senses.

4th, MORBID, like COMPARATIVE ANATOMY, assists in distinguishing those organs which are essential to life, from others of less importance, and also shews, that every part, even of the same bowel, is not equally sensible, or equally necessary to the prolongation of life.

5th, This study points out the uncertainties and

deficiencies of many parts of medical science, and particularly as to the method of cure, and hence may pave the way to a new and improved method of treatment.

There is reason to apprehend, that some students of medicine are not sufficiently apprized of the importance of MORBID ANATOMY, and of the light which it reflects upon the diagnosis and treatment of many diseases: hence they direct their attention chiefly, or almost solely, to the anatomy of the body in its sound state.

The accurate knowledge of the body in its sound state, undoubtedly affords much assistance in tracing the origin and progress of several diseases, and leads to many valuable practical deductions with respect to their nature and treatment.

But such a limited range of investigation is altogether inadequate to supply correct ideas of the morbid changes which take place during the different stages of the same disease, or of the circumstances which preceded the morbid change.

Besides, as there are not a few diseases which produce a change, not in the situation only, but also in the bulk and texture of the part affected, such a course of study is evidently incomplete, serving to give no information concerning their cause, or the means of counteracting its operation.

There is another description of students, who, though they acknowledge the intimate connection between MORBID ANATOMY and the practice of the different branches of Medicine, do not fully comprehend the extent of that connection.

Disease is very frequently productive of remarkable alterations in the Human Frame; in some instances diminishing, but in others enlarging the organ affected, and thus changing the relative situation of one part to another, or uniting those parts that are originally distinct, and forming preternatural communications between them.

By change of place, or change of bulk, the consequence of injury, or disease, the functions of contiguous viscera may be deranged.

Thus, the pressure of the enlarged Liver may interrupt the functions of the stomach; or the same cause impeding the free circulation of the blood through the different bowels of the belly, as well as through the Liver itself, may produce a dropsy of the belly.

The enlarged Liver is the source of still farther mischief; by pressing upon the gall ducts, it impedes the free passage of the bile into the intestinal canal; and the bile thus obstructed, passes off by another channel, and is taken up by the lymphatic vessels, occasioning jaundice.

Nor is this all the evil to be apprehended from the affection we are considering.

By means of inflammation, the enlarged Liver may be united with the neighbouring parts; and if, in such a situation, an abscess should take place within it, the contents of that abscess might be discharged into the general cavity of the belly, into the sacs of the pleuræ, or even into the lungs.

The progress of the disease called a Rupture or

Hernia, affords another and very striking example of the importance of the study of Morbid Anatomy; for even the most accurate knowledge of the anatomy of the body in its sound state, conveys but an imperfect idea of the state of the displaced parts, or of the state of the canal through which the displacement has been propagated.

The displaced portion of intestine pushes before it the thin, slippery, and elastic peritoneum, which lines the belly; and after such an occurrence, the lining soon loses its natural characters, being converted into a dense, lamellated membrane, which frequently contracts adhesions with the neighbouring parts.

The intestines, during the different stages of the disease, are more or less twisted, compressed, and often even inflamed. By consequence of the displacement, their coats become thicker, and are frequently fixed to each other, or to the sac containing them.

The aperture through which the bowels have passed, no longer preserves the same relation to the neighbouring parts, as in a state of health, and from inflammation its sides become thicker, as also the neighbouring cellular substance.

Of the preceding remarks, the disease called Stricture of the Urethra also affords a very strong illustration.

In the earlier stages of the disease, it only produces a membraneous growth, which in its future progress is converted into ligament, and even into

cartilage; and the neighbouring parts are frequently reduced to the same morbid state. In addition to the pain and difficulty in discharging the urine, the usual concomitants of stricture, the disease often occasions various constitutional symptoms: among these may be enumerated great nervous irritation, despondency, in some cases bordering upon delirium, and in other cases, symptoms similar to those which accompany the ague.

Now, even from these slight observations, it evidently results, that though the medical practitioner, whose anatomical knowledge has been derived solely from the study of the anatomy of the human body in a sound state, might perhaps form probable conjectures with regard to the various consequences of a diseased Liver, yet he would be soon constrained to confess his ignorance of many of the peculiarities of the disorder, and his inability to discover the root of the mischief, and the means of eradicating it. A few trials would convince him of the necessity of submitting to the task of examining the succession of morbid changes, characteristic of the disease, by the repeated dissection of patients who had been victims of its power; or at least, of directing his attention to the actual exhibition of these changes in morbid anatomical preparations, and to the description of the modes of treatment which the series of appearances had suggested.

This first law of the healing art, strongly impressed on the mind of Celsus, led him to deliver the following observation in the form of an axiom:—

" Eum recte curaturum, quem prima causæ origo non fefellerit." In truth, that practitioner only who has accustomed himself to trace, by actual dissection, the progress of the diseases of the Liver, or who has devoted his attention to those morbid preparations which exhibit and explain the results of dissection, can be qualified either to distinguish their nature and progress, or to form a just prognosis, and proper indications of cure.

On the same principle, the surgeon acquainted with the situation of the under abdominal aperture only in its healthy state, must be greatly embarrassed while performing the operation of Inguinal Hernia; for in such a case, that aperture retains neither its former size nor situation, having been united and involved with the adjacent cellular substance and fat; and when to these sources of uncertainty and embarrassment are superadded the great changes produced upon the displaced bowels, his perplexity must be proportionally increased.

With regard to the last disease to which I alluded, the Stricture of the Urethra, some of the valuable remarks which occur in the treatise of Mr Home, appear to me to apply with particular force to the condition of those surgeons, who have not acquired, from the study of Morbid Anatomy, an accurate idea of its nature and progress.

" For want of some criterion" (he observes,) " to guide our judgment in the investigation of diseases, we too often mistake the occasional symptoms for the disease itself; which, from the obscurity of its

situation, or its apparent insignificance, is totally neglected.

"Practitioners who are not in the habit of investigating diseases, but are satisfied with treating the symptoms which present themselves, are naturally very often led into this error.

"The constitutional symptoms (he adds) which belong to a Stricture of the Urethra, have been more frequently mistaken for an original disease, than those of any other local complaint*."

In short, the knowledge of MORBID ANATOMY contributes essentially to resolve the above, and many other difficulties, which occur daily in judging of the origin, progress, symptoms, and treatment of this great class of diseases, connected with a local derangement in structure.

The study of MORBID ANATOMY proves that parts similar in their structure are subject to the same diseases, and hence exposes the fallacy of many opinions respecting the nature and sources of organic diseases. Thus, small Cartilaginous Bodies have occasionally been found within the joints: these have been stated to be small portions of the Articular Cartilages, which have been detached in consequence of external violence; but if similar cartilaginous bodies have been found attached to other serous membranes, which are not in the vicinity of the Articular Cartilages, as within the vaginal coat of the testicle, or bursæ mucosæ, the theory falls to the ground.

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* Vid. Practical Observations on Strictures, Vol. II. p. 14.

Further, it has been stated by some authors, that Gonorrhœa attacks the urethra, by consequence of an affinity with the mucous glands of that organ; whereas a Gonorrhœa is merely an inflammation of a mucous membrane, and the symptoms and consequences of that disease are also similar to those of an inflammation of other mucous membranes.

In pointing out the utility of Morbid Anatomy, it ought not to be omitted, that this branch of science may enlarge our knowledge of the more obscure and minute structure of some parts of the human body.

Thus, it is acknowledged to be extremely difficult, on account of the small size of the lymphatic vessels, to discover the structure of their coats.

Morbid Anatomy removes this difficulty.

It is an established law in Pathology, that membranes of a similar structure are subject to similar diseases; and as in the coats of the lymphatic vessels we observe similar diseases as in other serous membranes, we conclude that one of the coats of these small vessels may be arranged under the head of serous membranes.

Morbid Anatomy may also be brought to the aid of Comparative Anatomy, in distinguishing those organs which are most essential to life, from others of less importance.

By comparing the internal organization of different animals, we are enabled to distinguish those parts which are common in the structure of every animal body, and essentially necessary for the per-

formance of the vital functions, from such as are peculiar to certain animals only, and exclusively subservient to their economy and habits of life.

Morbid Anatomy extends the sphere of this knowledge, by ascertaining the superior importance of some organs to others, in preserving the animal system.

There are certain bowels, on which life more immediately depends, and which, with great propriety, have been termed vital. There are others, which, though highly useful to the sound state of the animal structure, are not absolutely necessary to the prolongation of life.

The Thymus gland and Spleen seem to rank in this class; the former is absorbed before the fifteenth year, and the latter may be diseased, without creating such symptoms as are immediately fatal; and it may be extracted without occasioning any manifest derangement of the system.

On this interesting subject, Morbid Anatomy conveys still farther information; for it proves, that the functions of the animal economy may be continued, even though a considerable part of some of the bowels be in a diseased state, every part of the same organ not being equally important.

Thus, life has been prolonged, though one side of the Lungs, or one of the Kidnies have been destroyed; though a part of the Liver has been much diseased; though several inches of the Intestinal tube have been lost; and even though a considerable number of the vessels called Lacteal, through which

the nutritious part of our food passes into the blood, be obstructed.

Morbid Anatomy likewise shews, that particular parts of certain organs are much more sensible than others. Thus, pressure upon the upper part of the Brain may be supported for a time; but when made upon the under surface of that organ, very soon creates the most alarming symptoms, and often terminates in death.

The study of Morbid Anatomy is attended with another advantage; it points out the deficiencies and uncertainties of many parts of medical science, and may therefore direct the attention of the enlightened inquirer to those subjects which admit of, and require still farther investigation.

The study of organic derangements, in all their variety of appearances, must also prove a sovereign antidote against premature and ill-founded hypotheses, and conduct the profession to that species of experimental research, and inductive reasoning, which the genius of the great Bacon so happily introduced into other branches of philosophy; and we may thence learn to cherish with the greater anxiety that science which has so close a connection with the healing art, and which points out the most effectual remedy against those disorders which originate in a derangement in structure.

In the University of Edinburgh, the importance of Morbid Anatomy to the liberal and scientific study of medicine, has always been sensibly felt; and both my Grandfather and Father endeavoured,

as far as their other duties allowed, to introduce the most prominent features of that science into their lectures on anatomy, physiology, and surgery.

But in a course of Medical Instruction, comprehending so wide a field of inquiry as had been assigned to their charge, even though the term of lecturing extended to six months, it may easily be supposed, that only a small portion of time could be appropriated to a branch of the subject still overlooked or undervalued, and but too generally left, in the hurry for obtaining what was erroneously conceived to be more essential information, to the research and experience of a more advanced period of life.

The opinions of professional men are now more enlarged; and this department has become so interesting, and promises such valuable and extensive assistance to the healing art, that it can be treated with complete success only when it is converted into a distinct object of study.

These considerations, strongly impressed on my mind by the practice of my predecessors, and by the general current of medical opinion, induced me to deliver a separate course of Lectures on Morbid Anatomy, and to prepare the materials of the following Work.

My situation in the University naturally led me to bestow the most vigilant attention on the progress of anatomical pursuit, and its useful applications in the details of practice. These I was anxious to extend, and many local advantages favoured my de-

sign; for, in addition to the opportunities of knowledge afforded by private dissection, our Infirmary and Dispensary have afforded me various occasions of observing the more interesting forms of disease, and of examining the appearances of morbid bodies.

Besides, in the prosecution of this department of study, I have received the greatest assistance from the extensive field of observation and experience which my FATHER has long enjoyed, and which (for even the partialities of a son do not disqualify me to bear witness to the fact), he has most anxiously laboured, through a long life of varied and useful exertion, to improve, for the advancement of his science, and the benefit of mankind.

From the commencement of his professional career, he made it an invariable rule to collect and register the important cases, that had fallen under his notice, to subjoin his observations on each; and, in the event of the patient's death, to examine the body with minute attention. He also, as often as circumstances permitted, preserved the affected parts, with an accurate description of the morbid appearances.

The extensive collection of diseased preparations formed by the industry of my FATHER, and lately augmented by my own efforts, has afforded me an opportunity which few have enjoyed, of investigating the nature of morbid changes; for that collection now contains specimens of almost every disease connected with organic derangement, so disposed as

to exhibit a regular view of its progress. At the same time, I have not scrupled to solicit the aid of my colleagues in the University, and of other medical friends, and have received from them some valuable contributions, for which I publickly offer my warmest acknowledgments.

In these circumstances, I should hold myself inexcusable, were I to neglect so fair an opportunity of improving, or at least of attempting to improve this part of my profession, by communicating to the world a great number of facts, collected from actual observation of the dead body, the force or import of which cannot be weakened by false reasoning or ill-founded hypothesis, and which constitute a chain of evidence to which few can refuse their assent.

Having offered these preliminary remarks on the nature and importance of the subject, and on the considerations which strongly recommended it to my attention, I proceed to explain the general plan of the Work. It consists of two Parts: the First, containing a description of the morbid appearances discovered by dissection; the Second, a relation of the symptoms which preceded the patient's death. On this relation, a comparison is instituted between the symptoms which preceded death, and the appearances discovered by dissection.

With the exception of a few cases, which seemed to require particular consideration, I have confined my statements within these limits, leaving the reader to draw his own conclusions. And though this

instance of reserve may expose me to criticism, I am persuaded, that in the present state of the science, the more enlightened practitioner will do justice to the motive by which I have been actuated; facts being of more importance than opinions, till they can be fairly generalized, and resolved into a common law.

In justification of this method, and of the views from which it has proceeded, it may not be unnecessary to remark, that, in treating of MORBID ANATOMY, different authors have adopted different plans of investigation. With some, it forms an appendage only to a book on NATURAL ANATOMY; but a subject so extensive, so complicated in its nature, and so unspeakably useful in its practical applications, can never be treated with the requisite precision, till it be converted into a distinct branch of inquiry.

Other authors, impressed with this conviction, have run into an opposite extreme, and have swelled their books to an immoderate size, by the insertion of superfluous cases. In this excess, both plans appear to me to be liable to solid objections.

Where the diseased appearance is so frequent as to admit of generalization, particular illustrations seem superfluous; but where a diseased appearance is singular, or uncommon, it then becomes necessary to enter into a fuller detail, by an insertion of particular cases: for these, as Mr Abernethy has justly observed, "will probably convey more information in less words, than description or narrative, as they identify the kind of disease which is

meant to be described, and inform as it were by example *."

The arrangement which I have adopted differs a little from that of preceding authors; for, instead of describing in continuance all the organic derangements of the Gullet, of the Stomach, or of the Intestines, I have classed under one head the same diseases in these different parts of the alimentary canal, following rather the arrangement of diseases than of parts.

While this plan precludes unnecessary repetition, it seems to me to give more clear and precise ideas on the subject, serving farther to point out the distinction between the anomalous and the characteristic symptoms of the organic disease.

To the description of the morbid appearances, a brief enumeration of the concomitant symptoms is subjoined.

This is a very interesting, but a very difficult branch of the subject.

It would constitute the perfection of medical science, were we capable of deciding, in particular cases, what changes have taken place in the living body; for on such a decision, a correct diagnosis would be established, speculative opinions would be converted into demonstrative evidence, and a foundation truly rational laid, for regulating the details of medical practice. In confirmation of these sen-

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* Vid. his Classification of Tumours, p. 23.

timents, it is justly stated in the preface to Dr Stark's Works, "That a frequent, careful, and impartial comparison of the symptoms which have preceded death, with the appearances of the dead body, can alone lead to this desirable perfection."

Every medical practitioner who has enjoyed the benefits of experience, must be fully aware, that several circumstances concur in rendering the history of diseases imperfect, besides those which have been enumerated by Dr Cullen, in the subjoined note from the Preface to his Nosology *. Among such

---

* "A tempore igitur Sydenhami in hac re multum laboris nec frustra impensum est; rem tamen minime adhuc absolutam esse censeo. Multa parum accurata, multa erronea, multa denique prorsus falsa, historiis morborum, quas jam habemus, inesse, novit quisque in his aliquantulum versatus; et novit etiam ex variis causis hæc vitia subrepsisse. Scriptores enim, alii ad theorias sibi placentes stabiliendas, alii ad fidem remediis ad ipsis sive inventis sive multum laudatis conciliandam; vel veritatem, præconceptis occæcati, non percipiebant, vel etiam fictis et falsis corrumpebant. Plures, re omni quovis modo mirabili capti, quod ipsi facile crediderunt, alios credere cupientes, rem omnem præter modum amplificarunt. Plures denique, ut observationibus, hodie adeo expetitis, famam sibi compararent, historias in museo fictas, pro veris tradiderunt. Hæc omnia, si specialius indigitarem, de imperfecta hactenus morborum historia satis clare constaret; sed hæc omnia impræsentiarum prætermitto, et unum solummodo, in historiis morborum conscribendis, vitium, ad rem nostram maxime pertinens, indicatum volo.

Multi optimæ etiam fidei medici, in morbis observandis diligenter versati, in historiis eorum conscribendis sæpe ninium fecerunt. Non solum enim symptomata morbi cujusvis semper præsentia et inseparabilia, sed plura etiam, et cuncta quidem quovis

circumstances, the following will be admitted to hold no unimportant rank.

1st, Peculiarity of constitution, sex, manner of life, the imperfect manner in which patients describe their ailments, and the erroneous account which many physicians lead their patients to give of their situation, from taking up too hasty an opinion respecting the nature of the case.

2d, The imperfect knowledge we possess of the functions of some of the organs of the body. Thus, we do not know whether or not the Spleen be diseased, unless it has attained so great a bulk, as to be felt by an external examination.

3d, The different diseases to which several of the bowels are subject. Thus, in the diseases of the Heart, palpitation is a well marked symptom, which throws a veil over those less obvious symptoms which are characteristic of the particular disease; and in the same manner, jaundice is a feature of very different diseases of the Liver, and delirium of very opposite diseases of the Brain.

4th, The remarkable sympathy between neighbouring, and even distant organs, renders the source

---

tempore morbum comitantia, recensuerunt. Ita symptomata rarius, nec necessario cum morba conjuncta, et plura omnino adventitia et fortuita, notarunt; dum simul illa inusitata et fortuita ab usitatioribus et inseparabilibus distinguere penitus neglexerunt. Hinc, historiam morborum plenissimam reddere conantes, quæ ad distinctionem cujusque ab alio quovis conferre possent, omiferunt, immo difficiliorem reddiderunt."

of the disease obscure. Thus, the Stomach sympathizes with all the bowels; and, on the other hand, the functions of many of the bowels are deranged by a disordered state of the stomach.

It is also to be taken into account, that the distant sensations, or sympathetic feelings, frequently create the most acute pain, and give perhaps the earliest notice of the internal mischief.

From the nature or cause of the disease being imperfectly understood, or mistaken, the most baneful consequences originate.

The disease is neglected, or unskilfully treated at its beginning; the opportunity is lost of arresting its progress, or mitigating its severity; or it is aggravated by an improper method of treatment. How often, for example, are the various causes of colic mistaken? how common is it in all colics to have recourse to spirits?

If wind in the stomach, or indigestion, be the cause of the malady, the colic is removed; but if it should originate from inflammation, a worse remedy cannot be prescribed: it adds fuel to the fire.

5th, Diseases, during their different stages, assume different shapes, and there are various causes which accelerate or retard their progress.

6th, As medical aid is seldom required until the disease has made considerable progress, it may be difficult to detect the source of the evil, because diseases, and especially inflammation, are in many cases propagated with great rapidity from one part of the body to another. Such are some of the causes of

deception respecting the nature of organic diseases.

Before concluding, I cannot refrain from stating, that I have not attempted, by means of numerous quotations, to render my book an index to those already published; and to enter into an exact criticism of the works of preceding pathological authors, would exceed my present purpose.

My avocations do not allow me the leisure necessary to execute so delicate and laborious a task with the requisite exactness and impartiality; for I have persevered in writing, amidst varied engagements and much distraction, which left little time for weighing the evidence of opinions, or studying the elegancies of language and the harmony of the period. All that I have aimed at is simplicity of expression and perspicuity of style.

As language is frequently inadequate to convey a correct idea of morbid appearances, I have subjoined several engravings, which were taken from the drawings of eminent artists; and where colour constitutes an essential feature, it is added, in order that the engravings may be more faithful representations of nature.

The drawings of several of the plates were made by Mr Fyfe, whose talents as an anatomist and draughtsman are well known. Of the remainder, some were executed by the late Mr Donaldson (an artist of great merit), under the superintendence of my father, and have been in his cabinet for thirty

years. Some of the plates were etched by the same artist, and therefore do not possess the smoothness of engraving; but are not on that account less faithful or less spirited representations of nature.

I am also apprehensive, that, after the most careful attention I have employed in collecting and arranging the materials of the volume, many defects may still be discovered by a discerning eye, resulting not only from the omission of many important facts, but also from the misapplication of those which have come under my notice.

No one can be more sensible than myself of these defects; and I rely upon a favourable reception at the tribunal of the public, rather from the utility of the subject than from the manner in which it has been treated.

With the candid, I trust that the difficulties attending the execution of such a design, will plead in excuse of the imperfection of this treatise. To readers of this description, the appeal, perhaps, is unnecessary, as they are always disposed to join Mr Pott in opinion, "that he who thinks he can produce any benefit to society, needs not to be anxious about any apology for the publication of his ideas."

Should this book, by unfolding the nature of diseases which are accompanied with an organic derangement in structure, and by an exposition of the concomitant symptoms, tend to suggest the means of alleviating such diseases;—should it lead to the

advancement of Morbid Anatomy, by stimulating those engaged in the medical profession to the prosecution of a study, which forms the most solid foundation of medical science, and which must be regarded as the ground-work of a great building, to be finished by the united labour of future artists, it will afford me the most heartfelt gratification, and fully compensate the time and labour I have devoted to the subject.

MORBID ANATOMY, &c.

CHAPTER I.

GENERAL OBSERVATIONS UPON THE STRUCTURE AND MORBID ANATOMY OF THE ALIMENTARY CANAL.

From the nature of the functions assigned to the Alimentary Canal in the animal economy, any poison lodged in this fountain of life is rapidly communicated to the system; hence the investigation of the organic diseases incident to a part of our frame, of such primary necessity, constitutes one of the most extensive and important branches of pathology.

In order to pave the way for a clear and comprehensive view of this interesting subject, it may not be unnecessary, before proceeding to the more immediate object of inquiry, to offer a few very

general observations upon the structure and functions of the ALIMENTARY CANAL.

The canal through which the food passes, that repairs the waste, and sustains the strength of the corporeal system, is, in the lower classes of animals, of a very simple structure, consisting chiefly, or solely, of a bag into which the food is received, and of an aperture through which it is discharged. But in the higher classes of animals, it is more complex in its form and apparatus, being of considerable length, and enlarged in one or more places, so as to constitute a Stomach or Stomachs; and in such animals, the term Gullet is applied to the canal which leads into the Stomach, and the term Intestine, to that which leads out from the Stomach, and through which the food is conveyed out of the body.

Before the food reaches the Stomach, it is minutely divided by the teeth, and mixed with a considerable share of the spittle and mucus of the mouth and throat; and it is then carried, by means of the muscular power of the Gullet, into the Stomach.

The food, owing to the particular figure, position and structure of the orifices of the human Stomach, is retained within that organ until it has been submitted for a sufficient time to the action of the juice called gastric, by which it is converted into an uniform pulp, and in a degree digested. It then passes into the Intestinal Canal.

The human Intestinal Canal is about six times the length of the body, in order that the food may un-

dergo the necessary changes; that there may be sufficient space and time for the extraction of the more nutritious part of the food, by the lacteal vessels; that the chyle which escapes one set of lacteals may be taken up by another, and mixed with the mucus, bile, and pancreatic liquor within the intestines. The internal surface of the Intestines is much more extensive than the external; the inner coats being folded into doublings, which, performing in some measure the offices of valves, have been named by anatomists Valvulæ Conniventes. Thus, the internal surface is extended, and more space is given for the absorption of the nutritious part of the aliment, and the addition of those secreted fluids, which probably have a chemical effect upon our food.

The length, diameter, and structure of the coats of the Alimentary Canal, and the manner in which the different parts of that canal communicate with one another, which is more or less favourable to the exit or detention of the food, are by no means the same in different animals, and bear a relation to the kind of food. Thus, the Alimentary Canal of a graminivorous animal is not only much longer, but it is also much more capacious than that of a carnivorous animal.

The Alimentary Canal of an animal designed to live partly on vegetable, and partly on animal food, holds a middle place between that of a carnivorous and graminivorous animal. In this class man is included, and when the individual reaches to maturi-

ty, the ALIMENTARY CANAL is generally between thirty and thirty-six feet long.

The food is carried through this long and circuitous route by a series of powerful muscular fibres, which constitute one of the coats of the ALIMENTARY CANAL; and these coats perform their offices so accurately, as to propel their contents contrary to their gravity, and even to push forward air or quicksilver. To this effect, the muscles of the walls of the belly, and that muscle between the belly and chest, called diaphragm, essentially contributes.

The muscular coats also produce the peristaltic and antiperistaltic motion, which is kept up by the stimulus of the food. Thus, the various parts of the contents of the ALIMENTARY CANAL are intimately united, by which some are dissolved, others enter into new combinations, and thus also the Alimentary Mass is presented to the lacteal vessels, which take their run from the inner surface of the Intestines. The discharge of that part of our food which is useless, is accomplished by the muscular contraction of the coats of the intestines.

Without the addition of other coverings, besides the muscular coats, the ALIMENTARY CANAL would be exposed to be torn; therefore the membrane called peritoneum, which fixes the alimentary canal to the back-bone, is continued over the Stomach and Intestines, forming their external covering; and by the addition of this covering, the ALIMENTARY CANAL is enabled to resist over-distention, from air or fæces.

There is still another property, which is indispensably necessary in the ALIMENTARY CANAL, viz. a power of accommodating its cavity to the quantity of its contents. This is provided for by the elasticity and expansive power of all the coats, and by the introduction of a quantity of loose cellular substance between the muscular and villous coats, and also by the loose manner in which the stomach and intestines are fixed to the body.

Lest the ALIMENTARY CANAL should be injured by the acrimony of its contents, and in order to facilitate the passage of these, the innermost coat, called, from its resemblance to velvet, villous, is moistened and besmeared by a considerable quantity of a mucous fluid, which is derived from a number of glands, imbedded in the cellular substance, uniting the muscular and villous coats.

The Bile and Pancreatic liquors are added to the bolus of food during its course through the ALIMENTARY CANAL, in order to produce the necessary changes upon it, and to stimulate the coats of the intestines to their proper functions.

Such being the complex structure, and complex functions of the ALIMENTARY CANAL, it follows that it is much exposed to disease.

The aliment may be of a noxious quality, and various hurtful substances are occasionally swallowed along with it by accident or intention; and as it is of considerable length, and at the same time moveable, it is apt to be displaced.

The different coats of the ALIMENTARY CANAL are subject to diseases peculiar to each, as has long ago been observed by Dr C. Smyth*. The peritoneal coat is subject to those of other serous membranes; the muscular coat to those of other muscles; the cellular coat to those of the cellular substance; and the villous coat to those of other mucous membranes.

Moreover, the Mucous Glands of the ALIMENTARY CANAL are liable to the diseases of other glands of a similar structure, which perform a similar office.

Independently of those various sources of organic diseases in the coats of the ALIMENTARY CANAL, the bile and pancreatic liquor are sometimes so much altered in their nature, as to be incapable of producing the necessary changes upon the food, or of rousing the coats of the ALIMENTARY CANAL to their due functions.

THE ORGANIC DISEASES OF THE ALIMENTARY CANAL, investigated in the following pages, may be included in the six following classes:

The first class comprehends the explanation of the morbid effects which have resulted from hurtful substances swallowed by design or accident.

The second class, the organic affections peculiar to the coats of the ALIMENTARY CANAL.

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* Vid. London Med. Communications, Vol. II. p. 170.

The third, the nature and distressing consequences of the displacement of a part of the ALIMENTARY CANAL.

The fourth is dedicated to an explanation of the various malconformations of the ALIMENTARY CANAL.

The fifth, to a description of worms which occasionally infest the ALIMENTARY CANAL.

And, the 6th, to an enumeration of the causes which lead to an enlargement of those neighbouring organs, which, by pressing upon the ALIMENTARY CANAL, prove a mechanical obstruction to the progress of its contents.

Before entering into detail respecting these various ORGANIC DERANGEMENTS, it may not be improper to premise some general observations on the subject.

The greater part of the diseases of the ALIMENTARY CANAL, included in the above six classes, tend to obstruct the passage of the aliment to a greater or less degree, creating, in some instances, a permanent, but in others, only a temporary obstruction.

The permanent obstruction, by stricture, is of slow growth, but constant in its operation, and becomes greater and greater, either from the gradual increase of the concretion or tumour occasioning it, or from the gradual approximation of the opposite sides of the canal; whereas the stricture from spasm comes on suddenly, is generally of short duration,

and the spasmodic contraction frequently goes off spontaneously, or after the exhibition of proper remedies.

But on some occasions, the spasmodic contraction is not removed during life; and upon dissection we find the affected muscular coat of an unnatural hardness.

There is in some constitutions a remarkable disposition to diseases which obstruct the ALIMENTARY CANAL. I have met with several patients who have been so unfortunate as to labour under two very different causes of obstruction at the same time, or in succession.

The symptoms originating from very different causes of obstruction, are in some respects similar; the patient suffers much from a sense of tightness, pain, and soreness in the diseased part.

The Mucous Membrane being much irritated, the mucus, which is secreted in extraordinary quantity, instead of being a mild fluid, becomes thin, of a light green or yellow colour, and acquires an unnatural acrimony, so as sometimes to excoriate the neighbouring parts; and it is discharged in considerable quantity from the mouth, by hawking, or along with the fæces.

Those mucous glands, and their ducts, which are situated above the seat of the obstruction, being much irritated, attain an unnatural size, whilst those under it are not at all affected.

The above symptoms are occasionally aggravated

by catching cold; and, in these circumstances, and from the irritable nature of the patient's constitution, an unnatural local spasmodic contraction is sometimes excited, which aggravates his sufferings.

The constitution is at first but little affected, but in consequence of the duration of the obstructing cause, the digestive powers are much impaired. The patient loaths his food; what is taken becomes acid; he loses his spirits, and is occasionally very costive, but at other times is much weakened by a bilious diarrhœa. He becomes weak and emaciated, and has a quick pulse: he suffers, after a time, very great pain, owing to the distention by Air.

The Air accumulated within the Stomach and Intestines, sometimes distends these organs to such an uncommon size, that the convolutions of the intestines may be distinctly traced through the parietes of the Abdomen.

I have seen the Stomach Intestines distended to two or three times their natural size, and sometimes even ruptured by the unnatural distention.

It has been matter of dispute among physiologists, from what source the Air is derived.

It is not compatible with the object and limits of this volume, to enter at large into this question, which has afforded matter for much controversy. I shall therefore only observe, that, as far as I can judge, a part of it is swallowed, a part is formed by secretion, and a part is generated by fermentation.

As we sometimes meet with cases, where the dis-

tention, although so considerable as to cause great pain and uneasiness, yet has gone off gradually, and without the discharge of Air by the Mouth or Anus, it is probable that a part of the accumulated *Air* has been taken up by the Absorbent Vessels.

From the Abdomen being tense like a drum, where the Stomach and Intestines are distended by Air, the name Tympanites has been employed by Nosologists, to express this morbid state.

As the Air sometimes escapes from the Intestines into the general cavity of the Abdomen, in consequence of Wounds, Ulceration, and other diseases, Nosologists also describe the Tympanites Abdominalis.

It is of some moment to distinguish the one species of Tympany from the other, the former being a much less dangerous affection than the latter.

The Abdominal Tympany comes on suddenly, the belly is uniformly distended, in whatever posture the patient is, and also smooth; the patient is not sensible of wind moving within his bowels, nor does he hear the sound of it; and he is not relieved by passing wind, nor is the tension of the belly diminished by a purgative.

The Intestinal Tympany, on the other hand, comes on very gradually, the turns of the Intestines may be traced by a careful examination, and the sound of the Air, passing from the contracted to the dilated portion, may be perceived.

Besides, the patient is sensible of Air moving

from one place to another; and, whilst the AIR passes from one turn of the Intestines to another, he suffers pain, the Intestines being generally spasmodically straitened.

The patient also discharges an unusual quantity of AIR, upwards and downwards, by which he is much relieved.

It may not be unnecessary to add, that the Intestinal TYMPANY has been mistaken for a Dropsy of the Belly; and, on the other hand, when a small quantity of water is contained within the cavity of the belly, and when the Intestines have at the same time been filled by AIR, the distended Intestines float upon the water, and render it difficult, unless the patient be examined in different attitudes, to discover the water within the belly.

An acute INFLAMMATION is sometimes the sequel of the immoderate distention of the Stomach and Intestines; it is rapidly communicated from one part of the Abdomen to another, and very frequently proves fatal in a short time, by terminating in gangrene. But, in other cases, in the vicinity of the obstruction, we find the coats of that portion of the ALIMENTARY CANAL, immediately above the diseased part, much thickened, in the same manner as the MUSCULAR SUBSTANCE OF THE HEART AND OF THE BLADDER of URINE becomes much thickened, where there is an extraordinary impediment to the exit of the Blood or Urine.

In such cases, the MUSCULAR FIBRES become

thicker, redder, and stronger, to overcome the unnatural resistance.

In some cases, the part immediately above the obstruction, is extended into a Pouch. I have seen the Gullet, when an extraneous body has been lodged within it for a considerable time, or when it has been obstructed by any other cause, dilated into a large Pouch, which still farther obstructed the swallowing, and also the breathing; and when that Pouch is placed near to the termination of the Gullet in the Stomach, it may press so much upon the Heart and Lungs as to derange the functions of these organs.

In a similar manner, the Stomach, when the Pylorus has been obstructed, sometimes becomes so prodigiously enlarged, as to reach the Pelvis; and the Intestines are much dilated, from obstruction in any part of the Intestinal Canal.

I have seen the Intestinum Rectum, in consequence of obstruction, so much dilated, as to be capable of containing a child's head.

The Veins, in the Vicinity of the Obstruction, sometimes become enlarged, or Varicose, and add materially to the bulk of the tumour; so that when the Rectum has been extended in consequence of an unnatural obstruction, it proves an impediment to the free discharge of the Urine, or the contents of the Uterus.

But the part beneath the seat of the Obstruction

undergoes a very opposite change; it is always somewhat contracted in its diameter.

The unnatural Pouch, created by the Obstruction in the Alimentary Canal, generally adheres to the neighbouring parts.

The distention continuing, some part of the Pouch becomes thinner than the rest; the Absorbent Vessels are roused to act more powerfully than usual, by the stimulus of the unnatural distention; the Sac becomes thinner and thinner, and at length bursts; or the unnatural Sac is destroyed by Ulceration, thus a Communication is formed between neighbouring organs, as between the Gullet and Windpipe, between the Stomach and Colon, or between the contiguous turns of the Intestinal Canal. Through this unnatural Communication, the contents of the one part pass into another, which proves, on some occasions, the cause of instant death, as when the contents of the Gullet escape into the Windpipe; but, in other instances, life is thus prolonged, as when the Pylorus is obstructed, and when the contents of the Stomach pass directly into the Colon.

CHAPTER II.

HAVING made the preceding remarks, which are applicable to the various causes of obstruction of the ALIMENTARY CANAL, I proceed to describe the different classes of organic diseases of the GULLET, STOMACH, and INTESTINES.

CLASS I.

SECTION I.

Of Extraneous Bodies lodged within different Parts of the Alimentary Canal, and of their Effects.

THE Structure of the Gullet is peculiarly adapted to allow substances of considerable size to pass through it.

This is provided for, by the expansive power and elasticity of all its coats, and by the quantity of cellular substance which intervenes between the muscular and innermost coat; so that, when it is di-

vided transversely, it resembles one tube included within another.

Of the above observation, the following cases afford a strong illustration. The late Mr Alexander Wood gave my father a GLASS BALL, three inches in circumference, which had been swallowed by a Child two years old; it passed through the ALIMENTARY CANAL in two days, and did not produce a bad symptom. Even substances of considerable length, and sharp at one end, have passed through the ALIMENTARY CANAL, without injuring any part of it. A celebrated artist of this place, gave me a small pair of COMPASSES, two INCHES and a half LONG, which his daughter, a child three years old, had swallowed, and which passed through the ALIMENTARY CANAL in three days, without creating at the time, or afterwards, a distressing symptom.

But extraneous substances have frequently been detained in the Gullet, or some other part of the ALIMENTARY CANAL, and have given rise to various disagreeable consequences.

A sharp body, sticking in the Gullet, has sometimes proved the cause of CONVULSIONS.

Bartholin * has related the case of a young woman who was thrown into CONVULSIONS, by a small portion of glass sticking in her Gullet.

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* Vid. Cent. V. Hist. 66.

Notwithstanding the muscular structure, the elasticity and expansive power of all the coats of the Gullet, and more especially of the innermost coat, and the quantity of mucus by which the Gullet is besmeared, pieces of our food are sometimes DETAINED IN THEIR PASSAGE to the Stomach for a time, and occasion much pain, anxiety, and a sense of suffocation. In these circumstances, it is not necessary at the moment to endeavour to push the substance into the Stomach, unless there be a risk of immediate Suffocation; because, by remaining within the Gullet, being lubricated, softened, and probably partially dissolved, for it appears, (from a case related by Fabricius ab Aquapendente *,) that the liquor of the human Gullet possesses, in a slight degree, the power of dissolving, it will probably slip down into the Stomach.

It sometimes happens, that when the extraneous body sticking in the Gullet is of considerable bulk, and when it is not soon dislodged, it presses so much upon the Windpipe as to INTERRUPT THE BREATHING.

Mr C. Cheyne of Leith, was so obliging as to send me a quadrangular piece of hard Cartilage, which he took from the Gullet of a woman who was choked by it, with the subsequent account of the

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* Vid. Op. Chir. Cap. 39.

case. "Upon cutting into the Gullet and Windpipe, it was found fixed in the Gullet, by two of its angles pressing upon the sides of it. One of the angles protruded a few lines above the Gullet, it was fixed so as not to press upon the Windpipe; but, distending the Gullet in a great degree, its removal was not difficult. When taken out, it measured exactly two inches and a half in length, and one and three-fourths in breadth."

Wierus has related the history of a patient who was suffocated by an egg which had stuck in the Gullet *.

Mr Forster of Hull, sent my father a sole, which, by jumping into the throat of a fisherman, while he was endeavouring to secure it with his teeth, killed him. In the same manner, many cattle have been suffocated, by a turnip or potatoe sticking in the Gullet.

Even coagulated blood produces the same effect. I am acquainted with a gentleman who had nearly lost his life in the following manner. On account of an Inflammation in the upper part of his Pharynx, scarifying had been recommended. That operation was unskilfully performed, a very large quantity of blood was discharged, which rapidly coagulated, and by which he certainly would have

* Vid. Tom. I. Mem. De l'Acad. Chir. Paris.

been suffocated, had not a friend thrust his fingers into the Throat, and extracted the masses of coagulated blood.

But flat bodies, such as pieces of money, DO NOT OCCASION INSTANT DEATH when lodged within the Gullet; for they do not press much upon the Windpipe, nor do they prevent fluids from getting into the Stomach.

There is a specimen of this description in the Museum of Edinburgh, from which I published an engraving in my Thesis.

A halfpenny had stuck in the Gullet of a boy, which he had been attempting to swallow; it remained there for three years, and possibly might have remained there for a much longer period, had he not been seized with consumption, which proved fatal to him.

Upon dissection, the Gullet was found closely embracing the halfpenny, and considerably expanded by the piece of money.

A halfpenny stuck in the Gullet of another boy for six months, and was afterwards extracted by my father, by the blunt hook, which is represented in Table IV. Fig. 1. of my Thesis.

When an extraneous body has been detained at the origin of the Gullet, a SAC is, in some cases, formed of some length, which, passing down behind it, proves an additional impediment to the descent of the food, of which I met with a remarkable example.

But all danger is not over when the extraneous body has gotten into the Stomach or Intestinal Canal.

When an extraneous substance has been retained for some time within the Stomach, it irritates the villous coat of that organ very much; and in some cases is contained in a Sac within the Stomach, from which it cannot be dislodged, and proves a constant source of irritation and pain.

A pin, or other sharp substance, getting into the Stomach, may wound some of the LARGER BLOOD VESSELS of that very sensible organ, which is very amply supplied with blood by various blood-vessels, which very freely communicate with each other, and may occasion vomiting of blood.

A case occurred some time ago, in this place, in which the patient's death was imputed to a prune stone which he had swallowed, and which had occasioned a very great discharge of blood from the Stomach.

The Stomach has been PERFORATED BY SHARP-POINTED BODIES, as by Pins and Needles; and these have escaped from it into distant parts of the body, as into THE MUSCLES OF THE NECK, INTO THE URETER* or BLADDER OF URINE†. Dr C. Smyth informed me of the case of a woman who swallowed a number of pins, which, in the course

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* Vid. Jul. Cæsar, Claudin Resp. Med. 40.

† Vid. Plater, Tom. III. Lib. II. Cap. 10. De Mictione; also Diemerbroëk, Lib. Anat. Cap. 173.

of four weeks, worked their way out at her Neck, Breast, Arms, and Thighs.

Extraneous substances which have been swallowed, by perforating the Rectum, near to its termination, have been found to operate as a cause of Fistula. My father furnished me with a case of this description. He was requested to visit a gentleman, who had for a long time complained of an acute degree of pain around the Anus; this was followed by inflammation of the part, and a collection of pus. An incision was made, in order to give a discharge to the fluid; and one of the bones of the head of a fish was discovered sticking in the bottom of the abscess. Upon the bone being extracted, the patient in a short time recovered.

My father was consulted by another gentleman, on account of A LARGE FLAT TUMOUR in the cellular substance above the Sphincter Ani, between the coats of the Rectum, which created much uneasiness. Notwithstanding the remedies prescribed, the pain continued. Eighteen years afterwards the patient perceived a hard substance, which proved to be a SMALL BONE. It was cut upon and extracted, and the patient was cured. In this case, the BONE, which had been retained for a long time, had created an ulceration of the Rectum, and a SAC had been formed, in which the BONE had been lodged.

A pin, fish bone, or other sharp body, may excite an inflammation of the Intestines, or may PER-

FORATE them, and occasion a TYMPANITES ABDOMINIS;—as in the following case, which affords a good illustration of the consequences of local inflammation in the Intestines, which had been occasioned by two Pins, tied together with their points in opposite directions, which the patient had swallowed in soup, and from which, during his life, he had suffered the most excruciating torture, especially while riding on horseback. The pins had pierced the Intestine, and the air escaped from the Intestines by a hole, about the size of a goose quill.

On laying open this part of the Intestine, after death, the pins, which had been seen projecting, were found tied firmly to each other, of the same size, but with their points turned the reverse way. Each of the pins measured in length exactly one inch and three-eighths of an inch.

Both pins were of a black colour on the surface, and when examined by a magnifying glass, seemed rougher than new pins, and somewhat rusted.

The bowels of the belly adhered slightly to each other, in different places, and had lost their natural colour and smoothness. The small intestines were thickened, and of a deep purple colour, approaching to black, and were enlarged considerably beyond their natural size. About two pounds of fœtid pus were found in the cavity of the abdomen. On the left side of the body, the Jejunum had contracted two preternatural adhesions with the Mesocolon.

These adhesions were formed by two smooth and tough Cords, like ligaments, each about the size of a goose quill, and had the effect of considerably straitening the Gut.

A fish-bone, sticking in the Coats of the Intestines, proves, according to Dr Gregory, a cause of STRICTURE of the INTESTINES, as in the following case, which was communicated to me by letter by the Doctor, which I have given in his own words:

"SIR,

"Inclosed you have a small Fish-bone (supposed of a Flounder), which was found to-day in the COATS of the RECTUM, about three inches above the Anus of a Gentleman, æt. sixty-eight, who had long been very healthy; but for three or four years had been subject to frequent severe attacks of pain in his left Flank, and obstinate costiveness, alternating with diarrhœa. He had an attack of this kind on Tuesday last, 25th April 1809, which did not yield to repeated doses of Oleum Ricini (his usual medicine), nor to glysters, two of which were thrown up that night, with little or no effect. No vomiting; pulse sixty; skin cool all that day, and till past midnight, as Dr Kerr, the Staff Physician, assured me.

"A quarter before nine yesterday morning, the symptoms of Inflammation were plainly marked; pulse an hundred and ten, and strong; skin HOT; no vomiting; no stool: pain more severe, and, as

usual, increased on pressure. He was bled immediately to ʒxvi, and got every hour a tea-cupful of a strong decoction of Senna with Tamarinds. No buffy coat on the blood; no vomiting; no stool from the Senna. Eleven o'clock.—Abdomen growing TENSE; pulse one hundred and thirty-two, weak; extremities growing COOL. By two o'clock, pulse not to be felt at the wrist; head still clear; no vomiting; one small thin, very fœtid stool. He died twenty minutes past four. Abdomen before that time much swelled; much more after death. Opened at four to-day: Much Air in the Bowels, not in the Abdomen, but in it much reddish serum; no Adhesions; EXTENSIVE REDNESS of the small Intestine, and ALMOST GENERAL lividity of the great Intestine. In the RECTUM, a remarkable STRICTURE, EXTERNALLY like the contracted scar of a wound: internally, a foul gangrenous ulcer; coats thick and hard. In them was found the Fish-Bone. His servant, who saw it taken out, said, his master was very fond of boiled Flukes (Flounders).

" J. GREGORY.

" St Andrew's Square,
27th April, 1809."

The Dissection of the Body was performed by Dr Kerr, 27th April 1809, of which the account follows, in his own words:

" On opening the abdomen, about a quart of dark-co ored serous fluid was found effused in its cavi-

ty; and the Intestines were much distended with air, but did not at first view exhibit any other appearance of disease than that the blood-vessels of the transverse arch of the colon were somewhat fuller than in general after death. On tracing this Intestine towards the Rectum, the fulness was more conspicuous; and on the outer and anterior surface of the latter, about four inches from the anus, there was found a dark-coloured puckered mark, irregular in its shape, lumpy, and indurated, resembling the cicatrix of a former ulcer, occupying about two-thirds of the circumference of the gut. At this place the Rectum was considerably contracted in its diameter, and below, not distended with air. On dissecting, cut this portion of the Intestine to its lower extremity; and laying it open, this contraction was more evident, and there was found sticking in the centre of the dark-coloured part above mentioned, and penetrating through it, a small fish-bone, about an inch in length, and apparently that of a flounder. It seemed to have been a long time lodged there, as it was become quite black at the end which had so penetrated. The inner coat of the Intestine was found ulcerated, and the posterior part of the gut was somewhat thickened, but not indurated.

"There were no indurated fæces in any part of the Canal, but a good deal of thin fæculent fluid had issued through the anus after death."

Lastly, Pins, Needles, small Nails, pieces of

Bone, Stones of fruit, which have been swallowed, do not always pass through the Alimentary Canal, but are retained, and prove the nuclei of Alvine Concretions.

SECTION II.

Of Obstruction of the Alimentary Canal, occasioned by Alvine Concretions.

The term Concretion is, with great propriety, applied to those substances which have been discharged by vomiting or by stool, or which have been discovered within the Alimentary Canal by dissection; most of these being composed of fibres intimately matted together, like those of a hat, and formed on a central nucleus, as a prune or cherry-stone, a fragment of bone or wood, or a biliary calculus.

It is more common to meet with such Concretions within the Human Intestines than in the Stomach; but in Quadrupeds they are more frequent in the Stomach than the Intestines.

It is not my intention to describe those Concretions which are peculiar to Quadrupeds; this would be superfluous, after the excellent paper on that subject by Fourcroy and Vauquelin*. The follow-

* Vid. Annal. du Museum.

ing observations apply only to the Human Alvine Concretions, and are descriptive chiefly of the large Collection of these which has been formed by my Father.

After having examined the above extensive Collection, I consulted, from a desire of obtaining farther information on the subject, the works of the most eminent Pathological authors, and subjoin the result of my researches.

The Museum at Leyden, formed of the joint Anatomical Collections of Rau, Albinus, Ledeboer, Van Doeveren, and part of the Museum of Ruysch, and of the numerous dissections of the pupils of that Seminary of Medical Instruction, contains, according to Dr Edward Sandifort (who has published a description of it in two large folio volumes), only one specimen of an Alvine Concretion, and that was found in the Ilium.

Dr Walter, of Berlin, has published, in three large quarto volumes, a descriptive Catalogue of the Anatomical Museum which he sold to the King of Prussia, but has described only one case in which he met with an Alvine Concretion, "qui inter membranam muscularem et nerveam ventriculi hæsit."

Morgagni, who practised in Italy, has published in his thirty-seventh Letter, and twenty-fourth Article, the histories of several Calculi which he met with in the Alimentary Canal; but from his

description of these, I am inclined to suppose that the greater part of them had been formed originally within the Gall Bladder, or Biliary Ducts, and had passed afterwards into the Intestinal Canal.

He has described very accurately the external characters, and also the internal structure of Biliary Calculi. He observes, speaking of those calculi found in the Intestinal Canal, "Interna substantia meros ostendebat circulos striis intersectos;" and in another passage he adds, "Interius ex circumjectis stratis compactos, et propius centrum ex striis radiatim pergentibus quas inter disjectæ erant albæ splendentesque particulæ." He adds, "Facile pro biliariis habeas."

Lieutaud, of Paris, has described, in the 17th page of the first volume of his Historia Anatomico Medica, nine cases taken from other authors, in which what he calls Lapides were found in the Stomach; and in the 77th page of the same volume, nine cases, also borrowed, in which Lapides were found in the Intestinal Canal.

Dr Portal, of Paris, from the manner in which he has expressed himself in the fifth volume of his Anatomie Medicale *, seems to me to have met with only one example of an Alvine Concretion

* "J'ai trouvé dans l'estomac d'un cadavre ouvert pour une de mes leçons d'anatomie une concrétion d'un volume et de la

within the Stomach, and only one case of a Concretion within the Intestines *, which he observes was *bilieuse*.

In the GERMAN EPHEMERIDES, several cases are described, in which what are called CALCULI were found within different parts of the Alimentary Canal †.

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forme d'un œuf de pigeon : elle contenoit dans son centre deux ou trois autres concrétions qui crépitoient sur le feu ; sa substance étoit jaune et amère, véritablement bilieuse : enfin dans quelques estomacs on a trouvé des concrétions qui avoient la solidité et la forme des pierres urinaires."—Vid. Tom. V. p. 192.

* "Ces concrétions pierreuses peuvent être, ou seulement bilieuses, ou formées d'un noyau de bile sur lequel se sont placées des couches d'autres matières, alimentaires, fécales, lymphatiques, visqueuses, etc. On a trouvé dans les intestins des pierres aussi grosses qu'un œuf de poule, d'une substance diverse. J'en ai vu qui avoient pour noyau une concrétion de la nature des pierres pancréatiques."—Vid. Tom. V. Anat. Medic. p. 239.

† Ephem. Nat. Cur. Dec. I. Ann. II. Obs. 89. 136.
Ann. IV & V. Obs. 99. 125.
Ann. VIII. Obs. 50. 70.
Ann. IX & X. Obs. 90. Obs. 122.
Dec. II. Ann. I. Obs. 96. Ann. VII. Obs. 136. Obs. 185. *(tophacea dejectio.)* Obs. 202. *(arena.)* Obs. 244. *(cholelithi.)* Ann. VIII. Obs. 184. Ann. X. Obs. 90.
Dec. III. Ann. III. Obs. 21. 94. Ann. X. Obs. 108.
Ann. VII & VIII. app. p. 71.
Ann. IX & X. Obs. 246.
Cent. I. Obs. 57.
Cent. III & IV. Obs. 136.
Cent. IX. Obs. 21.

Baron Haller, who was for many years a Professor at Goettingen, has not described a single case in his Opuscula Pathologica, in which he met with an Alvine Concretion.

Dr Baillie, of London, in his Morbid Anatomy of the Human Body, says of Calculi in the Stomach, "they have never come under my observation, and are to be reckoned very uncommon *." And he has added, † "Calculous Matter has sometimes been known to be accumulated in some part of the cavity of the Intestinal Canal, especially in the great intestine; but this has not come under my own observation, and, at least in the human subject, is a very rare occurrence."

I also consulted the Lithologia of Martin Schurig, published at Leipsic, who appears to have met with only three or four cases of Calculi in the Alimentary Canal; but he has many quotations from authors. He appears to me to have arranged under one head extraneous bodies that have been swallowed, and alvine concretions; for he names some of those substances, which have been passed by stool, or been found within the intestines, Silices‡, others Lapillos Durissimos§, others Albicantes, rufos, griseos, tophaceos‖, and others, as he says, were like Biliary Calculi.

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* Vid. Morbid Anatomy, 2d Edition. † P. 194.
‡ Vid. p. 161. § Vid. p. 154. ‖ Vid. p. 154.

He seems to have met with but one case in which the Concretion was like to most of those in the Museum of the University of Edinburgh, which he calls Substantiæ raræ et spongiosæ, magnitudine dimidii ovi*.

As there is so little mention made by the most eminent authors on Pathology respecting Alvine Concretions, I hope the reader may be induced to pardon the length of the following article.

Of their Size.

The size of these Concretions is very various. Some do not exceed a Garden Pea in size; but others are as large as an Orange. My Grandfather has described several he met with as being five, six, seven, and even eight inches in circumference; and in the case of a woman who consulted my Father, a concretion was three years thereafter taken out of the Colon, by Mr Renton, Surgeon in Pennycuick, which weighed four pounds.

Of their Figure.

The larger Concretions are more irregular in figure than the smaller, Vid. Plate I. Fig. 1., the former having an outer crust, which gives them a very unequal surface, whilst others seem to be made up of a congeries of smaller calculi. Vid. Plate III.

Some Alvine Concretions are perforated by a number of small holes, like some Corals.

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* Vid. p. 157.

The smaller Concretions are somewhat of an oval or spherical shape, somewhat flattened at the sides, like that represented in Fig. 3. of Plate I., which is probably occasioned by the friction and pressure of one Concretion upon another; and some Concretions have so much impressed each other, as to resemble Cup and Ball.

My Grandfather has observed, when describing a case in which several Concretions were passed, "That the largest of these five balls, which was the first extracted, is five inches in circumference, and something globular, but with several prominences, and flat surfaces. Most of the flat parts had a smooth shining tartarous thin coat; the rest of it was more rough, and of a spongy appearance. The two last brought away are less in bulk, and without so much tartarous crust; the two small ones are all covered over with a shining tartarous crust, which in several places is prettily variegated with different shades of an ashy colour. One of them has some resemblance in shape to the shell of a tortoise; the other, or smallest, may be compared to two pyramids, joined by a common base *."

Of their External Colour.

The Colour of the smaller Calculi differs from that of the larger, the former having no external coating.

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* Vid. Quarto Edition of his Works, p. 668.

The colour of the surface of thirty-five of the Concretions in the Museum of Edinburgh, is nearly the same, resembling that of bad yellow ochre of iron, whereas most of the larger calculi are encrusted by earthy matter, of a coffee-colour, and purple, and others by white matter, which seems to have been deposited in thin successive layers.

Of the Number of Concretions.

There are very seldom above two Concretions within the Intestinal Canal.

My father, however, discovered within the arch of the Colon of a boy, who was much emaciated, twelve Concretions, all of which were of different sizes, and were afterwards passed by stool. A very considerable number of Concretions has been found within the Stomach.

Lazoni met with ten; and Bilger has related the history of the case of an old man, in whose Stomach he met with thirty calculi of different sizes.

Of the Structure of such Concretions.

All the Human Alvine Concretions which were collected by my Father, are (with one exception) similar as to Structure; all are more or less porous, and somewhat like to dried sponge, and, when examined by the aid of a magnifying glass, seem to be made up of a number of very small fibres, intimately interwoven with each other, like those in

a hat, or in chamois leather; and the interstices between the fibres are filled up by earthy matter.

In consistence, these Concretions resemble dried sponge, and, like it, may be cut with a sharp knife; but when a blunt knife is used, the dried Concretion crumbles into pieces. There are small holes on the surface of a few Concretions, vid. Plate I. Fig. 2., which pass for about half an inch into the substance of the calculus; and in one of the specimens there are twelve cavities, of a cylindrical form, which penetrated as far as the very centre of the Concretions, and were filled with a viscid mucus. An Intestinal Concretion has been described by Baillou, which was completely perforated, and the liquid fæces passed through the aperture.

The external Crust of the larger Concretions seldom exceeds two or three lines in thickness, is deposited in layers, and when dry, is friable, and apt to split and crack off.

In some of the specimens, the external earthy crust covers only a part of the calculus.

Upon making a section of most Alvine Concretions, these are found to be composed of distinct layers of yellow or brown, vid. Plate II.; but in some Concretions, the layers do not pervade every part of the calculi. In four or five of the Concretions there are no layers observed.

The lamellæ, which are about two lines in thickness, are generally of a lighter colour than the rest of the calculus, but sometimes darker. The exter-

nal form of the calculus seems to determine the course of the layers: vid. Plate II. If the calculus be of an oval shape, the component layers of it follow a similar direction; but if the Concretion be irregular on its surface, the layers are disposed so as to correspond in their course with the irregular surface.

The lamellæ, upon a minute examination, do not form one continued line, as in Biliary or Urinary calculi.

In the centre of the Concretion, a Prune, or a Cherry-stone, or a small piece of Bone (vid. Plate II.), or a biliary calculus, is generally found.

Within some Alvine Concretions, there are cavities, filled by small grains of Sand, and fixed to each other by several small fibres.

Within the upper part of the Concretion which is represented in Fig. 1. of Plate I., there are a number of distinct white shining crystals.

By exposure to the air, the internal part of the Concretion acquires a darker colour.

Beside the more common kinds of Intestinal Concretions, there are others which also merit mention. I received from Dr Henry of Manchester, a Concretion which had been lodged for some time within the intestines, which he discovered, upon analysis, to be composed solely of Magnesia, which the patient, during his life, took in very large quantities.

Calculi, in all respects similar to Biliary Calculi,

have also been found within the Alimentary Canal *.

There is a third kind of Concretion, which consists chiefly of inspissated lymph; and this inspissated lymph sometimes serves to bind together Cherry-stones, or other extraneous bodies, which have been accidentally swallowed.

Concretions of this description sometimes attain a considerable bulk, and produce costiveness, distention of the bowels, and symptoms of incipient inflammation.

Some authors have described a species of white Calculus, which has been discharged by vomiting, by persons afflicted by Gout; but I have never seen any specimen of that sort, and may be permitted to suggest, that it has probably some relation to that kind of Biliary Calculus which resembles spermaceti.

In order to throw farther light upon the nature of these Concretions, I have subjoined descriptions of three of the more common kind of Alvine Concretions, drawn up according to the manner of Werner, by my Colleague, Professor Jamieson.

No. I.

Colour, of the cut surface, intermediate between yellowish brown and chesnut brown.

Shape, tuberose, and perforated.

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* Vid. Morgagni, Epist. 37. Art. 24.

Lustre, dull.

Fracture, delicate promiscuous fibrous.

Transparency, opaque.

Streak, not altered in the streak.

Hardness, yields readily to the nail, and receives an impression from the finger.

Tenacity, sectile.

Frangibility, difficultly frangible.

Feel, feels fine and rather meagre.

Is light.

N. B. The external shape is coated with a dark-brown-coloured crust, which is soft, brittle, resinous in the streak, and light. Some parts of this crust are covered with an ash-grey coloured crust, which is softer than the brown crust, and is sectile.

No. II.

Colour, of the external surface dark ochre yellow. The cut surface exhibits concentric stripes of different breadths. The broadest stripes are nearly olive green; the narrower yellowish grey, and ash grey.

Shape, botryoidal; in some places inclining to tuberose.

Lustre, dull.

Fracture, of the broad stripes very delicate promiscuous fibrous; of the narrow apparently even.

Transparency, opaque.
Streak, unchanged in the streak.
Tenacity, sectile.
Frangibility, difficultly frangible.
Feel, feels fine, and rather meagre.

No. III.

Colour, external surface is pale ochre yellow, inclining to wood brown. Internal surface exhibits concentric stripes, and the colour of these inclines more or less to wood brown.
Shape, pyriform.
Lustre, dull.
Fracture, delicate promiscuous fibrous.
Distinct Concretions, appears to be composed of concentric lamellar concretions.
Transparency, opaque.
Streak, not altered in the streak.
Hardness, soft.
Tenacity, sectile.
Frangibility, difficultly frangible.
Feel, feels fine, but rather meagre.
Light.

Of the Effects of Alvine Concretions upon the Alimentary Canal.

I. Such alvine Concretions as have been detained for years within the Alimentary Canal, become gra-

dually larger, and cannot be moved from one part of the intestines to another. They then disturb the functions of the Alimentary Canal, prove a source of great irritation, by interrupting the progress of the Fæces, and frequently occasion an acute inflammation of the intestines.

II. In more favourable circumstances, the coats of the intestines are expanded into a sac which lodges the Concretion, and the sac acquires considerable thickness in process of time.

The alvine Concretion, imbedded within its sac, proves a source of considerable obstruction to the progress of the feculent matter. Hence the intestines are distended in an unnatural manner above the seat of the obstruction.

Plates III. and IV. explain very fully the above description of the effects of an alvine concretion; as these were taken from a preparation, in which the caput cæcum coli was much dilated, in consequence of a concretion which had been lodged within it.

The convolutions of the intestines between the Concretion and the stomach had been much dilated; the termination of the ilium, and even the Appendix Vermiformis had attained an unnatural size.

III. As Alvine Concretions are a source of much irritation, we sometimes find the organ which contains the extraneous body contracted upon it. "Ven-

triculum valde parvum rugosum, extrinsècus plicis refertum atque veluti contractum," says Schenk *.

IV. Alvine Concretions have been said sometimes to ADHERE to the inner coat of the Intestinal Canal †.

V. STRICTURE OF THE INTESTINE is another effect of the irritation occasioned by an Alvine Concretion.

I have met with this effect in the body of a woman, whose Ilium contained a couple of Alvine Concretions.

Upon examining the Intestine, immediately beneath the place where the Concretions were lodged, there was an evident CONTRACTION, of a livid colour, as if a piece of String had been tied around the Intestine very tightly.

The Intestines above the CONTRACTED PORTION were much dilated; and their coats, which were much thicker than usual, had lost their usual Structure, and very much resembled thick Leather which had been soaked in Water.

Upon opening the intestine above the constricted part, a small aperture was found in its coats, through which pus had been discharged into the Cavity of the Abdomen.

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* Vid. Lib. iii. † Vid. Horstii Observ. 321.

The Peritoneal Coat, and the greater share of the small Intestines, was highly inflamed.

VI. Alvine Concretions sometimes irritate so much as to occasion an ULCERATION of the Stomach or Intestines.

There are two cases of that description preserved in the Museum of Edinburgh, in which the Alvine Concretions had occasioned ulceration of part of the Intestine; and in one of these the Concretion had filled up the unnatural aperture so completely, that even air did not escape into the Cavity of the Abdomen*.

It was evident, from the thickened edges of the aperture, that it had been of considerable duration.

Of the Chemical Analysis of Alvine Concretions.

Very different statements have been published upon this branch of the subject by authors; which seem to have been derived from the mere inspection of the Concretions, but not from experiment. But, from the external characters, it is not possible to form an accurate opinion of the composition of Alvine Concretions.

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* Vid. Plate IV.

Morgagni * and Dr Portal † have represented Alvine Concretions to be similar to Biliary Calculi. Others have compared them to indurated fæces ‡;

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* Vid. Letter XXXVII.

† Vid. Anat. Medic. Tom. V.

‡ Van Swieten has published his opinion of the nature of alvine concretions, in the following words. Vid. Vol. III. p. 193. "In quibusdam hominibus vitam sedentariam agentibus, et crassa edulia non facile subigenda, ingerentibus, imprimis si inertior simul bilis fuerit, in intestino duodeno quod satis contractum est, et valvulas copiosas habet, accumulatur, talis materies, quæ expresso liquido indurescit, obturat intestini cavum."

"Les concretions contenues dans les intestins sont de deux espèces. Les unes sont de veritables pierres biliaires devenues successivement assez volumineuses dans le canal intestinal, pour en interrompre jusqu'à un certain point la continuité. Les autres sont des portions d'excrémens durcis par leur séjour, et formant un corps ordinairement rond dans le centre duquel est un noyau de cerise, de prune, un petit fragment d'os, une très petite balle de plomb, ou tout autre corps solide qui a été avalé, et sur lequel des matières stercorales se sont accumulées couches par couches. Ces concrétions stercolares sont friables, lègères, quoique volumineuses, ont une couleur brune, se ramollissent lorsqu'on les expose au feu, et jettent une fumée fétide." Vid. Lassus Pathologie Chirurgicale, Tom. II. p. 566.

"Des concrétions formées dans les gros intestins, et spécialement dans le rectum, par l'accumulation et le séjour prolongé des matières fécalés, peuvent occasionner des constipations opiniâtres qui ne cèdent qu'à leur extraction. Tantôt ces concrétions de matières durcies ne renferment aucun corps étranger; d'autres fois un calcul biliaire leur sert de noyau; dans beaucoup des cas,

an opinion which probably took its origin from an examination of one species of those Concretions which are occasionally found within the Stomach or Intestines of Horses, Oxen, and Deer; and which seem to be made up chiefly of the fibres of the indigestible part of the food, which has been agglutinated by the Mucus of the Alimentary Canal.

The only authors who, so far as I can learn, have made any Chemical experiments upon human Alvine Concretions, are Mr CADET * and Dr POR-

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ce sont les fecs elles-mêmes ramassées et durcies par l'absorption de leurs parties les plus liquides." Vid. Richerand, Nosographie Chirurgicale, Tom. III. p. 412.

" Calculi Intestinales, in Intestinis crassis præcipue obvii atque a materia terrestri a scybalis durissimis aut variis corporibus alienis ingestis orti," &c. Vid. Callisen, Syst. Chir. Hod. Vol. II. p. 674.

* " M. Morand ayant engagé M. Cadet très-habile Chymiste, et Apothicaire de l'Hôtel Royal des Invalides, à examiner la pierre communiquée par M. Moreau ; voici l'analyse qu'il en a donnée. 1. Cette concrétion est d'un poids fort léger, et laisse sous le doigt une impression savonneuse comme la craye de Briançon. 2. Les couches dont elle est composée, sont les unes de couleur cendrée, les autres blanchâtres. 3. Cette matiere mise sur les charbons ardens se boursoufle, et répand l'odeur animale. 4. Par la distillation d'une demi-once de cette matiere dans une cornue de verre au fourneau de reverbere, la premiere liqueur qui en a été retiree, étoit un phlegme empyreumatique qui pesoit douze grains; la seconde avoit une odeur d'alkali volatil très-pénétrante, et pesoit dix grains. En poussant la distillation, la matiere a fourni trois gros d'une huile rouge, claire et fœtide, qui

TAL *. But Mr CADET made his experiments when Chemistry may be said to have been in its infant state; for Chemical Analysis had not arrived at the perfection it has now attained, and I must doubt whether Dr PORTAL possessed a sufficient share of Chemical knowledge, to qualify him for undertaking the Analysis of such compound substances, as Alvine Concretions; and whether his Experiments were of such a kind, as to enable him to draw just conclusions respecting their nature.

If the experiments of Mr CADET, who was a distinguished chemist of his day, were rude and imperfect, we may reasonably infer, that those of Dr PORTAL are liable to still greater objections.

From what has been stated, it is obvious, that the greater number of authors of the present day have adopted the sentiments of MORGAGNI and VAN SWIETEN, respecting the nature of Alvine Concretions.

The authority of great names is too apt to generate and to foster indolence, which sometimes leads us to adopt, and to receive, as a kind of inheri-

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étant réfroidie, a pris une consistence butryeuse. Après l'opération, il est resté dans la cornue une matiere charbonneuse, qui après avoir été calcinée à feu ouvert, n'a produit qu'un principe terreux."—Vid. Mem. de l'Acad. Royal. de Chir. Tom. III. p. 15.

* Vid. Anat. Med. Tom. V. p. 192.

tance, the opinions of our forefathers; and to leave them in the condition we received them to our posterity. It is incumbent upon us, in the prosecution of science, to receive the opinions which have been handed down to us with much respect, but not without much caution and circumspection; and especially such as relate to the science of chemistry. By suffering these to pass unexamined, by neglecting to weigh the evidence by which they are supported, we are incapable of separating those which are plausible, from such as are the result of much patient inquiry, and experimental research. Let us bear in mind the remark of SENECA, who has justly observed, "*Multum egerunt qui ante nos fuerunt, sed non peregerunt, multum adhuc restat operæ, multumque restabit, neque ulli nato post mille sæcula, præcidetur occasio aliquid adhuc adjiciendi.*"

In these circumstances, I thought it of great moment, that some gentleman, much conversant in Modern Chemistry, should examine the large collection of Alvine Concretions formed by my Father, consisting of FORTY-TWO SPECIMENS, and was so fortunate as to prevail on Dr THOMAS THOMSON, who is well known to the Chemical World, to undertake the task.

His labours have thrown much new light upon the subject, as the reader will find from the annexed report, which he sent me.

"The calculi which I examined are of a much

more compound nature than I expected, and contain two substances, of a nature quite peculiar, or at least with which I was not before acquainted. The following observations will convey a general idea of their nature and composition.

"1. At first they swim in water; but that is owing to the numerous pores filled with air, which they contain. Accordingly, they soon sink to the bottom, and remain there. The specific gravity I found to vary in different specimens, from 1.376 to 1.540. I consider 1.400 as about the average specific gravity of the whole.

"2. When left in cold water they soon communicate a brownish tinge. The water was found to have taken up the following substances: 1. Albumen, which was separated in white flakes by boiling the water. 2. A BROWN SUBSTANCE, which I consider as peculiar. It dissolved at first in water, but became nearly insoluble, by the slow evaporation of the liquid. It dissolved in alcohol. It approached most nearly, in its properties, to vegetable EXTRACTIVE; but the quantity which I obtained was too small for an exact examination. 3. Common salt, which crystallized when the water was allowed to evaporate spontaneously in an open vessel. 4. Phosphate of lime, which was precipitated by ammonia. 5. Sulphate of soda, in a very minute proportion. 6. Perhaps also sulphate of lime; but the quantity of this salt must have been very small.

" 3. Alcohol dissolved the peculiar brown matter, and some of the salts, but extracted nothing particular.

" 4. Potash ley separated the albumen, the brown matter, and perhaps some of the salts.

" 5. Muriatic acid separated a notable proportion of phosphate of lime.

" 6. After the action of all these re-agents, there remained behind a peculiar substance, having the colour and texture of the calculus. Ten grains of calculus left 1.2 grains of this matter. It was very light, and had the appearance of cork, or rather of the peculiar fungus which is used on the continent for tinder, and which the French call Amador. It was in very short threads. This substance is tasteless, insoluble in water, alcohol, ether, potash ley, and muriatic acid. It blackens sulphuric acid, and is dissolved, being partly reduced to charcoal. In nitric acid it dissolves very slowly, and only when assisted by heat, and hardly effervesces. When the solution is evaporated to dryness, a whitish residue remains, which has a bitterish taste, and is imperfectly soluble in water. Nitric acid does not convert it into any of the vegetable acids, though digested on it repeatedly. This substance burns with a slight flame, and rather like a vegetable than an animal body. It is undoubtedly of a peculiar nature, differing from every animal and vegetable substance hitherto examined. Its insolubility in

potash ley distinguishes it readily from Wood. It has no resemblance to any animal substance whatever.

" 7. The calculi consist essentially of alternate layers of this peculiar substance, and of phosphate of lime. Sometimes the substances are intimately mixed, instead of being in alternate layers. The albumen and brown matter seem to serve as a cement. The other substances are in a small proportion.

" The crust on the outside of some of the calculi consists of phosphate of lime, mixed with a brown animal matter.

" In a few specimens, I observed crystals of phosphate of ammonia and magnesia, upon the outside crust of the calculi; but these appearances are uncommon.

Such are the constituents of the calculi, as far as examined. I have retained thin slices of two or three, and mean hereafter to ascertain the proportions of the different constituents with exactness. In two calculi, the phosphate of lime amounted to rather more than half the weight of the whole. In one specimen, the albumen separated was one-twenty-seventh of the whole; but I have reason to believe that a portion still remained. The quantity of common salt, and sulphate of soda, was small. I could detect no potash by the test of muriate of platinum. Neither was there any ammonia pre-

sent, or carbonate of lime, both of which I expected to find. I examined the calculi carefully for uric acid, but found none. Neither could I detect any uvea. These substances abound in urinary calculi.

"The preceding details are sufficient to show, that the calculi in question are of a very *different nature* from any hitherto examined. They are of a much more *insoluble nature* than urinary calculi. Indeed no solvent exists, except of a nature so corrosive that it could not be applied."

Of the Symptoms.

Alvine Concretions prove a source of much irritation, and impair the functions of the Stomach and Intestines, creating at the same time much griping, and sometimes very acute pain.

The pain in the bowels is, in some cases, fixed to one part, is much more severe upon one occasion than another, especially after taking acids, or food of difficult digestion, and is frequently attended by nausea and vomiting.

Some patients are much constipated for two or three days, and have yet a constant inclination to go to stool. Others have watery stools, and discharge, along with these, a quantity of a viscid ropy mucus, or blood, after which they are much relieved.

Some patients discharge their stools involuntarily.

Upon relaxing the parietes of the Abdomen, a very hard, painful, globular tumour may generally be felt, most frequently in the course of the large Intestines.

It can seldom be made to change its place within the Intestine; but often appears to do so in consequence of the change of place of the Intestine which contains it. Hence the change appears greatest where the Concretion is within the small Intestines or arch of the Colon, which, from the length of Mesentery, or Mesocolon, are very moveable.

The digestive powers being much impaired, the patient becomes very weak, and much emaciated; and, from the continuance of the disease, is reduced to a skeleton.

The Pulse, in the earlier stages of the disease, is but little affected.

Concretions have, in some cases, remained for years before they have been dislodged.

In the more fortunate cases, the Concretion, after exciting severe nausea and vomiting, has been ejected along with the contents of the Stomach, or discharged by stool, or extracted from the Rectum.

It is not a little remarkable, considering the bulk of some of these Concretions, that the Intestinal Canal is not more frequently completely obstructed.

The Intestines, from the duration of the disease, become more and more obstructed, so that Laxatives by the Mouth, or clysters, are necessary to procure a passage. Some patients are under the necessity of abstaining from solid food.

Upon the Alvine Concretion changing its place, and passing down into the Sigmoid Flexure of the Colon, or into the Rectum, it creates excruciating torture in the region of the Pelvis, and the bowels become much distended, from the passage being suddenly interrupted, and the patient apprehends instant death, as in the subjoined letter of Mr Marshall to my father.

" *Peebles, 9th May* 1799.

" Dear Doctor,

" I herewith send you two Concretions, or Stones passed, I may rather say extracted, from the Rectum. I can give but a very imperfect account of this young man's case. He is seventeen years of age, and says he has been in bad health for six years. He sent for me to the country lately, in a great hurry, to take away some hardened excrement, which he could not pass. *He thought he must die instantly.* I went, and took with me the Polypus Forceps.

" After throwing up some warm oil, I extracted, by the Forceps, one of the Stones, and the other came away soon after, without assistance. I shall be happy to have your opinion of their nature, after

you have examined them. You may keep one of them to shew in the class, if you please; the other you may return to me.

"I am, dear Doctor,

"ROBERT MARSHALL."

My father received from two other Surgeons, the late Mr Mein of Dunse, and Mr Goodsir in Largo, Concretions which were extracted in the same manner.

Alvine Concretions sticking in the Rectum may be felt with the finger, and in some instances occasion a retention of urine.

An Alvine Concretion lodged in the Rectum, only a little way above the Sphincter Ani, sometimes creates much pain while the patient is sitting; and the pain becomes still more excruciating upon his going to stool.

When the Rectum has become very much distended, in consequence of the Alvine Concretion, it sometimes is discharged along with the fæces; or it may be readily extracted by the forceps, as in the preceding case; and when there are two or more Concretions within it, upon extracting one of them by the forceps (which are used for extracting calculi from the bladder of urine), the others are commonly discharged along with the fæces*.

* Vid. my Grandfather's Works, p. 667.

From what has been stated respecting the effects of Alvine Concretions upon the Alimentary canal, it follows that these may at first be moved from one part of it to another, but become afterwards immoveable; a circumstance which merits the most particular attention, as it marks the progress of the disease, and points out the chance there may be of dislodging the Concretion.

In order to illustrate more fully the symptoms occasioned by Concretions within the Intestines, I have subjoined the following Cases from my father's Case-book.

CASE I.

This patient came from the country, and brought with him a letter from Sir Alexander Douglas, physician in Dundee.

"Sir,—The bearer of this letter, Mr M., comes to consult you about a disorder of many years standing, and I believe of a very singular nature. You will learn much better from himself, than from any account I am able to give you, the rise and progress of it. I think it only necessary to inform you, that within these two months he has had frequent attacks of violent pain in the region of the spleen, preceded by vomiting, and tension of the stomach and abdomen, sometimes attended with a looseness. No evacuations or medicines, however, give the

least relief, excepting opiates, and external fomentations of poppy heads, or the warm-bath, which give always present ease; and sometimes the paroxysm, if I may call it so, keeps off for three or four days. I have never observed the least degree of fever, or quickness of pulse, during the most severe fits of pain.

"I shall be extremely glad to know your opinion of Mr M.'s case. I am, Sir,

Your obedient servant,

ALEXR. DOUGLAS."

Nov. 25th, 1768.

My father, in a personal interview with the above patient, learnt that he had laboured under acute pain in the belly for seven years, and that about five years ago, he had passed three excrementitious-looking Concretions, after which a Tumour was observed between the Ribs and Ilium of the left side.

He therefore wrote the following letter to Sir A. Douglas.

"*Edinburgh, Nov.* 28. 1768.

"SIR,—Having carefully examined and considered Mr M.'s case, I am altogether certain that his complaints proceed from a Concretion lodged within the left side of the Colon, of the same kind probably with those he passed some years ago, and of which I have in my possession about thirty, taken from different patients.

" As it is impossible to reach it from the anus, so as to extract it with a pair of Forceps, the patient should carefully observe the following directions, by which it is hoped he may in no long time pass the Concretion, or bring it past the turn of the Colon into the Rectum, so that it may be got hold of with an instrument, and extracted.

" He ought to take every night, at bed-time, a tea-spoonful, or as much of the lenitive electuary as shall be found sufficient to procure one loose stool; and in the morning a clyster, composed of an English pint of warm milk, to which two table-spoonfuls of olive oil are to be added; and this should be retained for an hour, if possible, by laying in bed, with the buttocks raised by pillows.

" When he goes to stool, he ought, with his hand, to push the Concretion downwards as far as he can, without raising considerable pain, and to sit over the steam of hot water, making efforts longer than is commonly necessary; and even when he is not at stool, he ought frequently through the day to work it downwards with his hand; and by squeezing as if he were at stool, or by putting his finger, or a feather, into his throat, to occasion such an effort as is made when we vomit.

" Once in ten days, or oftener, he should take a purgative, and on the evening of that day a laxative clyster; and when the clyster begins to operate, let him take an emetic, and go into the warm bath.

" A dozen or two of pills, made of Castile Soap, in a table-spoonful or two of oil, taken every day, may probably be of considerable service.

" A flannel shirt should be worn, and through the day a piece of Fur should be laid upon the Tumour.

" His diet ought to consist chiefly of Bread, Milk, Soup, or Broth, with a little Fowl, Jellies, or plain roasted or boiled meat.

" Moderate walking, or riding on horseback, will be of service; but fatigue is to be avoided.

" I believe I need not add, that excess in eating or drinking might prove highly dangerous.

" No Chirurgical operation is to be performed, unless the Concretion should altogether stop the passage through the guts, so as to bring on dangerous symptoms, such as could not be removed by medicines. In that case, indeed, an operation, though very dangerous, might be necessary."

The following year, my Father received the subsequent letters from his patient.

" *Dundee*, 20*th Feb.* 1769.

" As Dr Sir Alexr. Douglas left this on Wednesday last for Edinburgh, he promised he would wait on you on Friday, at farthest, and that I might expect to hear from either you or him on Sunday; but as I have had no letter, am apt to think he has forgotten.

" My disorder rather increases. I am in continual

pain; my appetite is quite gone; I get no sleep but from opium, which undoubtedly will soon reduce me very low; indeed, I am so already.

"The Concretion still remains in the same place. In March, I found the tumour a hand-breadth lower than it had been in November.

I am, Sir,
Your very humble servant,
JOHN M."

Upon this letter, my father wrote the following memorandum: "In March, the Tumour was a hand-breadth lower than it had been in November, or half-way between the anterior Spinous process of the Ilium and the Os Pubis.

"Instead of the former clyster, I recommended an Infusion of Lintseed with Oil, and to throw in as much as his Guts would receive. He found that he could receive a Chopin of it, and thought it reached as high as the tumour.

"I prescribed the following mixture:

℞. Mannæ, iij.
Vitel. Ovi, ʒij.
Olei Olivar. ℥ss.
Misce, dein. adde Sal. Glauber. ℥i.
Solut. in aq. fontan. ℥vi.

"He took this purgative in the morning, once a-week; at night the Clyster, and then the Emetic, and passed the Clyster in time of the vomiting."

" *Dundee, 2d April* 1769.

" Upon feeling for the lump yesterday, to my surprise I found it quite away from the lower part of the Groin, where it used to give me much pain from every thing that passed it.

" Ever since, I have suffered great pain across the fundament; and I have passed nothing these two days and nights. I cannot throw up one-sixth part so much of the Clyster as I used to do, and that gives me much pain. I am continually very thirsty, have a great pain across my stomach, and the parts there are all extended more than usual.

" I took physic this morning, but it has not produced any effect.

" There is a very great rumbling in my stomach; the wind, &c. roll about continually, but do not come lower down. Dr Farquharson tried if he could feel the Concretion, by introducing his finger, but could not; but said, the parts above where he felt were much extended. In this case, I do not know what course to take. The stoppage is the only thing that frightens me. I cannot eat any thing. Pray, let me have your answer in course.

I am, Sir, &c.

JOHN M. jun."

" P. S.—Since I wrote the other side, I have been seized with a violent vomiting."

" This gentleman died before my answer reached Dundee, on the 24th of April 1769.

" After his death, a very large Concretion was found in the lower part of the Sigmoid Flexure of the Colon *."

The following continuation of the case was drawn up by the late Dr Mitchell, of Dundee, and sent to my Father.

" *Dundee, Dec. 8th*, 1772.

" On the 24th April 1769, at ten in the morning, Mr M. complained of a most violent pain about the pit of his stomach. His pulse, though not quicker than it commonly is in people in health, was small, weak, and unequal, and his skin covered with a clammy sweat.

" He had for several years complained of a hard Tumour in the left side of his body, under the margin of the ribs.

" Two days ago, this tumour had descended to the left groin, where it was still to be felt through the parietes of the abdomen, though not quite so distinctly as formerly. On the 23d, from a purging medicine he had taken, he had a copious stool.

" In the morning of the 24th, he took three grains of opium, which he soon after vomited, along with some green, dark-coloured bilious matter.

" He continued to vomit the same sort of stuff, with

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* Vid. Plate I. Fig. 1.

every thing he took, till his death. At nine in the evening he became very weak, his breathing difficult, pulse hardly to be felt, still sensible, and wishing anxiously for death, which happened about an hour after. The body was opened a few hours after his death.

" Upon laying open the cavity of the abdomen, there ran out about a pound, as far as could be guessed, of thin, white, fœtid matter, in every respect resembling Pus. The small Intestines occupied the whole anterior part of the abdomen; so that, till they were removed, nothing else could be seen, except a small portion of the Colon, towards the left Os Ilium. The portion of the Colon mentioned, contained in its cavity the hardness formerly felt through the teguments of the abdomen.

" The surface of the small Intestines, especially towards the Epigastrium, was covered with a thick, well-concocted Pus. The contiguous convolutions of the Intestines were glued together by a substance which seemed to have been very recently formed. The colour of these Intestines was not different from the natural. Upon turning aside the small Intestines, the whole tract of the Colon came in view; the right side of which, as also the transverse part of the Colon, were of a very red colour, and covered by many turgid blood-vessels.

" The middle of the transverse portion of the Colon, and also its sigmoid flexure, were somewhat dilated.

"The Concretion was perceived within the left side of the Colon, which was redder than usual. After cutting into it, a strong concretion, of an irregular figure, about four inches in diameter, with many rough knobs and prominences on its surface, was extracted *.

"This Concretion, when washed and dried, weighed, the day after, ℥vi and ℈v. The whole tract of the great Intestines above the Concretion was filled with thick pieces, of the consistence of stiff clay. The sigmoid flexure of the Colon was less conspicuous than usual; for this intestine descended almost direcly from the spleen to the Os Ilium, where it made a short turn to the right, and was afterwards continued downwards into the Pelvis, to form the Rectum. The Colon, on this left side, adhered to the kidnies, and more firmly than usual to the muscles and Peritoneum; so that *an incision might have been made into the Gut, without penetrating into the Abdomen.* The Pus met with in the Abdomen, affords an instance of the purulent exudation, not uncommon in Inflammations of the cavities of the body. The Stomach was small, very much corrugated in its inside, and empty; but to appearance perfectly sound, as were all the other viscera, both of the Thorax and Abdomen. The spleen was small, and neither it nor the liver descended below the margin of the ribs. The Gall-Bladder was full of a

* Vid. Plate I. Fig. 1.

thin, dark-coloured Bile. The existence of this Concretion, and its situation, was seen as you predicted. *The Incision of the Colon, which you used to recommend in your Lectures,* could in this case have been easily performed; and had it been attempted in time, might have saved the Patient's life."

CASE II.

The next Case which I shall insert, is that of an elderly woman, who had been for many years afflicted by Alvine Concretions, and who consulted my father, at the suggestion of Dr HALL of Jedburgh. The case was written in the form of a letter to Dr HALL.

"*Edinburgh, July 3d* 1788.

"DEAR SIR,

"I am of opinion that your patient's complaints are entirely owing to Balls which have formed within the cavity of the Intestines. I have met with many instances of this disorder, and have in my possession about Thirty such balls, which have been passed by stool, by different persons, or extracted from the anus, or found within the Intestines after death. They are as firm in their texture as a hat, and cannot be dissolved by any medicine which could be used with safety.

"In this case, when the patient is laid on her back, I can distinctly feel three irregular-shaped Balls,

Two of them are each as large as a Hen's Egg, supposed to be made flat a little by pressure. The third, which is undermost, is about the size of a Chesnut. I could make them move upon each other, and they can all be moved a little way upwards or downwards. They are situated at the fore-part of the upper end of the Os Ilium; and by pressure are moved upwards, as high as to the under edge of the twelfth rib, and I have little or no doubt, are contained within the Caput Coli.

" From their size, I am very doubtful whether, by any medicines, they can be discharged by stool; but if they shall not be discharged, and should, by increasing, or by change of place, obstruct and stop the passage entirely, it is, I apprehend, possible to save the life of the patient, by taking them out by an operation. For, as the Colon is, on its back part, not covered by the Peritoneum, but connected by Cellular substance only to the muscles, if an incision be made on the posterior part of it, between the Twelfth Rib and upper part of the Ilium, or immediately above the Ilium, the Colon may be opened without opening into the Cavity of the Belly; and the wound, I have little doubt, could be cured without much danger, especially that in the course of last year, I have seen it in one case wounded by a Pistol Ball, and in another eroded at this very place; and yet in both the openings were healed soon.

" If, therefore, these Balls are not passed by Stool,

nor moved from their present place by the medicines, and the pains grow intolerable and wasting to her; or that there shall happen a stoppage of the fæces through the Canal, by these balls enlarging, or changing place with respect to each other, I would recommend that an operation shall be performed in the following manner:

" Let an incision be made from the Twelfth Rib, at the distance of two inches from its point, directly downwards to the top of the Os Ilium. Then cut slowly, and with great caution, inwards and forwards, till the back of the Colon is laid bare for a little way. Then, with one hand, press on the forepart of the Tumour, and, with a finger of the other hand, try whether you feel the Tumours within the Colon. If you think you do, make a very small hole in the Colon, and introduce a probe; and by that means make it certain that the Balls are there by touching them with it. Then, with the greatest caution, enlarge the Incision as much as is necessary, for introducing a pair of Forceps, such as are used in Lithotomy, for laying hold of, and extracting them. After they are extracted, and fæces that may be collected there are pressed out at the Wound, let the sides of the Incision be pressed together, and let the external part of the Incision be stitched, by Sutures passed through the Skin, at the distance of a finger-breadth from each other. Cover the Stitches and Incision with Straps

of adhesive Plaster, and with thick Pledgets spread with Ceratum Simplex, and with a compress and bandage, so as to exclude the Air.

" Before, however, recourse is had to the operation, let a trial be made of the following means:

" 1. Let her take, every day, a quarter of an ounce of Castile Soap, in Pills.

" 2. Once or twice a-week, let her take a purgative, composed of Sal Glauber; ʒi, Sugar half an ounce, and the same of Sallad Oil and Whey lbss. or lbj.

" 3. Three times a-week let her get a Clyster of an English Quart (Chopin) of Water, in which an ounce of Lintseed and half an ounce of Castile Soap have been infused for two hours.

" 4. Let her foment the Belly, and take the above Clyster when she suffers much pain.

" 5. Let her Diet consist of Loaf-Bread, Milk, Whey, Broth, soft Eggs, Butter, a bit of light dressed Meat; and if she takes Porridge, let her melt a good deal of Butter in it."

P. S. The late Mr Alexander Wood, to whom my father sent the above patient with a note, found the Balls distinctly, and thought them in the Caput Coli.

My father requested Dr Hall to inform him of the sequel of the case, with which request Dr Hall complied.

" Sir,—I am happy to fulfil your request, by informing you of the progress, &c. of Mrs S.'s complaints. You may, perhaps, not immediately recollect her; but when I mention the circumstance of her labouring under Concretions or Balls, lodged in the Caput Coli, it may probably recall the case to your remembrance. For half a year after she had your advice, and whilst she continued to employ the medicines, &c. prescribed, she acquired flesh and strength daily, and the Concretions remained stationary; but having, in consequence of finding herself so much *relieved*, neglected since then to employ the same course, I found, upon being called to her a week ago, a great increase of her complaints; her strength much impaired, her body emaciated, and the Balls, in point of size, much increased; and these accompanied with febrile heat, &c. irregular belly, and frequently excruciating pain. Sensible, however, as she seems to be of her dangerous situation, she declares, even although a total stop should be put to all alvine excretion, a resolution of *not submitting to any operation.* I am in hopes, however, from the husband being an intelligent man, to obtain permission to open the body; and in that event I shall be happy to avail myself of the opportunity it will afford me to transmit you the Balls. I beg you would be assured I am, Sir, with very great respect,

Your most humble servant,

R. Hall.

" Jedburgh, 8th May, 1789."

"Sir,—I had your favour; and in answer thereto, beg leave to inform you, that Mrs S., who laboured under Concretions of the Bowels, died some time ago. I am sorry to say, that every endeavour, the most strenuous, to have the body inspected, proved fruitless, and insufficient to overcome the husband's bigotry. Before her death, I *pressed, as the only probability of saving her life, the operation*, but without effect. I am, Sir, with the greatest respect,

Your very humble servant,

R. Hall.

"Jedburgh, 14th July, 1789."

CASE III.

"1789, Sept. —— M'Kenzie, tailor in Edinburgh, æt. 38 years, has for eight years had a Ball in his Intestines. About three years ago, when I first saw him with Dr Gregory, it was felt at the right side of the umbilicus, and appeared to be about the size of a large walnut. It is now considerably enlarged, and has fallen down as low as the Os Pubis, and is not near so moveable as formerly. Castor oil was prescribed, which has always kept his body open. He is often in great pain, and is willing to submit to any operation; but as there is still reason to hope that the Concretion may be discharged by the Anus, and as there is no adhesion of the gut to the containing parts, an operation was not thought advisable.

"The patient died a few months thereafter, and a Concretion, larger than a golf-ball, was found in the Ilium, near its lower end, which I have preserved."

Since that time my father met with a similar Case, which is represented in Plates III. and IV., and in which, after death, he cut out, from the Caput Cæcum Coli, very large Concretions, by making an Incision in the Posterior part of the Colon, in the manner he had for many years proposed in his public Lectures *, and had proposed to be done in the foregoing Cases.

Conclusion.

The preceding observations appear to me to have established the following propositions:

I. That the greater number of Alvine Concretions are made up of fibres, which are intimately matted together, and which probably have been attracted by a central nucleus.

II. That Alvine Concretions occasion a derangement of the functions of the Alimentary Canal, and create griping, obstinate and long-continued colicky pains, which are generally limited to that part of the Intestinal Canal, which contains the Concretion, and which are occasionally more severe upon

* Vid. the Manuscript copy of his Lectures, Lect. 71., which was written by Mr Thorburn in the year 1770.

the patient taking acids, or food of difficult digestion.

III. That the Alvine Concretions may be gerally felt within the Intestines, and when two or more of these are lodged within the Intestines, these may be made to strike against each other.

IV. That Alvine Concretions frequently change their situation, and pass down into the Rectum, which is thereby much extended, and, when so situated, occasion acute pain and sense of weight in the back part of the Pelvis, which is attended by a constant desire to go to stool, which the patient cannot gratify; and they may, by the finger, or by an instrument, introduced into the Rectum, be felt within it.

V. That Alvine Concretions, formed within the human Alimentary Canal, are, in some cases, discharged by vomiting, or along with the fæces.

VI. That an Alvine Concretion, after a certain time, cannot be moved from one portion of the Alimentary Canal to another, owing to its increase in bulk, to the expansion of the coats of that part which contains the Concretion into a sac, and to the unnatural constriction immediately below the seat of the Alvine Concretion.

VII. That Alvine Concretions must prove a mechanical obstruction to the passage of the Aliment through the Intestines; and if proper means be not taken to remove the Cause of the Obstruction, in-

flammation of the Intestines follows, which proves fatal.

VIII. From the Chemical Analysis of the Concretions, it is evident that Alvine Concretions are of a very peculiar nature, and different from all Vegetable or Animal productions; and that Solvents, sufficiently powerful to act upon those Concretions within the Intestines, cannot be employed, with impunity, to give the least hope of decomposing those substances within the Body, and evacuating them in the ordinary way.

IX. That in the earlier stages of the disease, while the Concretion may be moved from one part of the Intestines to another, all that can be done, is, to operate on the bowels, partly through the medium of mechanical action, and partly by lubricating the Alimentary Canal by the exhibition of proper medicines, in order that the Concretion may be discharged along with the fæces, or may descend into the Rectum, from which it may be artificially extracted.

X. That after the disease has been of long standing, and when a Sac has been formed, which retains the Concretion in a certain place, it cannot be removed, should it be lodged within the Colon, but by an Incision; an operation from which, in the case of Mr M., formerly mentioned, hopes of saving the patient were entertained; and the examination of the patient's body led Dr Mitchell to observe, "*that the incision of the Colon might have*

been easily performed; and had it been attempted in time, it might have saved the patient's life."

It is surely much to be desired, that other Cases, equally favourable, might occur to a judicious and experienced practitioner, for bringing this operation, proposed by my father, to the fair test of experiment. I consider this as an object of great importance, not to the profession merely, but to the general interests of humanity; and entertain the hope, that my researches, and the collateral information furnished by my friends, may contribute to extend this useful branch of the healing Art, and to pave the way for the removal of Alvine Concretions, which, when retained within the Intestines, waste the vigour of the frame*, and abridge the period of human life.

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* My Grandfather, in his description of the case of a boy afflicted by this disorder, has observed, "that his parents asserted he was scarce of so large a stature, after six years of his disease, as he was at the beginning of it." Vid. his Works, p. 667.

Plate I.

EXPLANATION OF THE PLATES.

PLATE I.

In this plate, three Alvine Concretions are represented.

Fig. 1. This Alvine Concretion was extracted from the body of Mr M——, whose case has been fully detailed.

The figure of this Alvine Concretion is different from that of any other specimen in the Museum of Edinburgh, most of these being of a round or oval figure.

The greater part of this Alvine Concretion was encrusted by a dark-coloured substance, about two lines in thickness, which seems to have been deposited in successive layers.

In the interior part of the uppermost part of the Concretion there were a few shining crystals, which was another peculiarity in this remarkable Concretion.

Fig. 2. and 3. represent two of twelve Alvine Concretions, which were discharged by stool, by a boy of 12 years of age, who was a patient of my father.

PLATE II.

Represents the Section of an Alvine Concretion. This Concretion was composed of a number of distinct layers, and in the centre of it there was a small piece of Bone.

PLATE III.

Exhibits a large Alvine Concretion within the Caput Cæcum Coli, by cutting open the posterior part of the Caput Coli.

C D E F, The common Teguments and Abdominal Muscles divided.

G, A section of the Coats of the Colon.

H, The unequal surface of the Alvine Concretion.

K O, The Right side, or ascending part of the Colon.

PLATE IV.

Exhibits a View of the Cavity of the Caput Coli after taking out the Concretion.

C D E F, The Common Integuments and Abdominal Muscles divided.

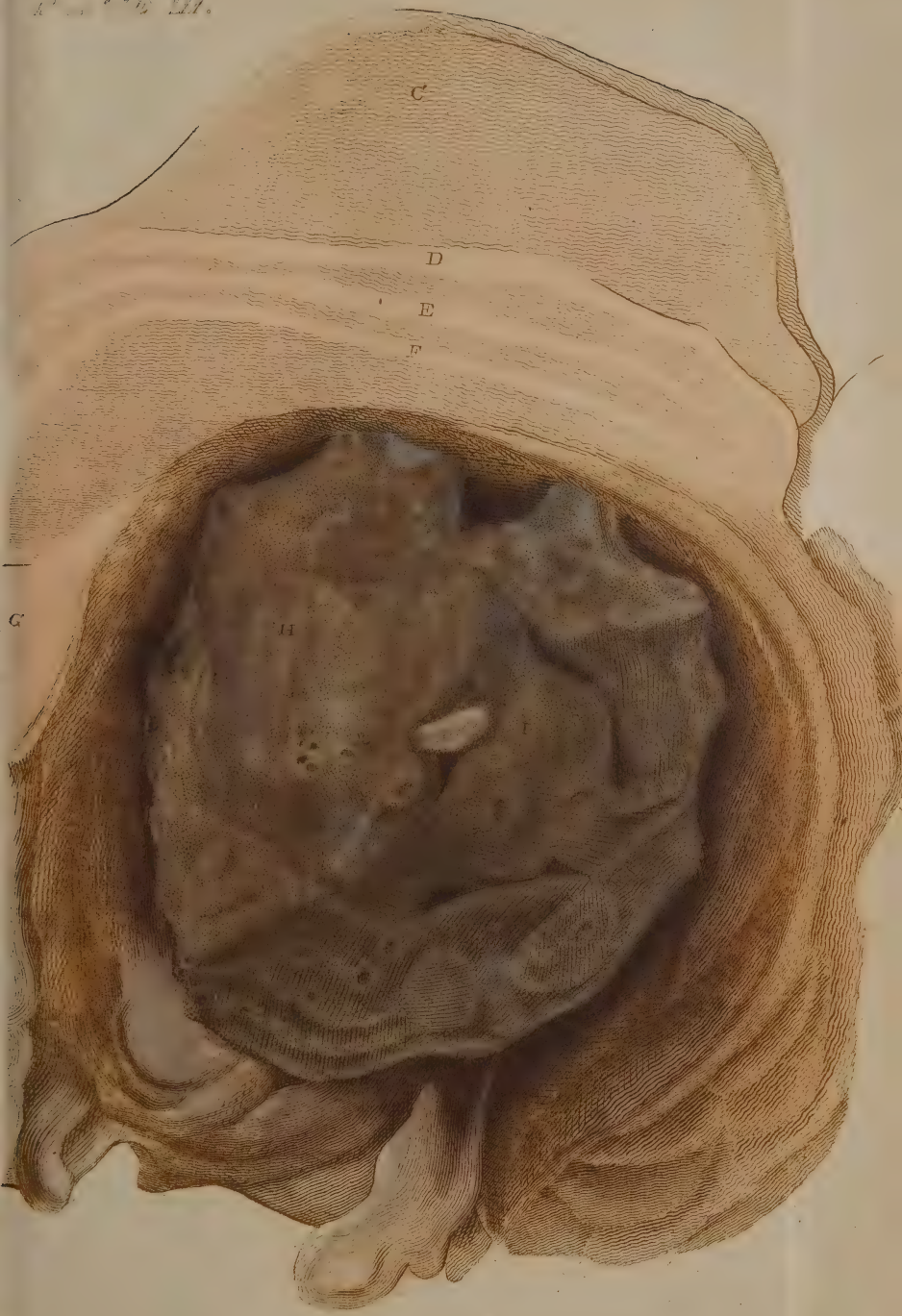
C
D
E
F
G
H
I

PLATE IV.

L, A probe passed from the Ilium through the Valve of the Colon into the Caput Coli. The Valve was thickened and altered in shape.

M, A probe introduced into the Appendix Vermiformis.

N, A probe passed from the Caput Coli into the right or ascending part of the Colon; at N between the Caput Coli, and right ascending part of the Colon, there was a great degree of Contraction.

Q, A probe passed through a hole in the Colon, into the Cavity of the Abdomen, which was plugged up by a part of the Alvine Concretion.

SECTION III.

Of Calculi of the Tonsils.

This section is supplemental to the former, and is descriptive of those Calculi which occasionally have been contained within the Tonsils, and also of the concomitant symptoms.

This disease is by no means frequent; in proof of which, those rich repositories of Pathological knowledge, the Letters of Morgagni, the descriptive Catalogues of the Leyden and Berlin Anatomical Museum, by Drs Sandefort and Walter, the Anatomie Medicale of the learned Dr Portal of Paris, the Nosologia Methodica of Sauvages, the Chirurgia Hodierna of Callisen, the Nosographie Chirurgicale of Richerand, and the Pathologie Chirurgicale of Lassus, do not afford any information respecting this subject.

Even in Schurig's Lithologia, a book professedly written on Calculi of different parts of the Human Body, mention is made but of two examples of this complaint, and these are borrowed from Kentmannus de Calcul., and from Nicol Blegny, Zodiac. Med. Gallic. an. IV. and V. Febr. Obs. 4.

Three Cases of this disease occurred to Mr Wilson, Surgeon at Beith, and were transmitted to me, along with the Calculi, by Mr Allan Burns of Glasgow.

Two of the patients were members of the same family, were far advanced in life, had laboured under the disease for many years, which occasioned coughing and difficulty in swallowing; and, at length the Calculi were discharged, after having excited a considerable suppuration in the Tonsils.

In justice to Mr Wilson, I have subjoined his account of the cases.

CASE I.

"*24th January* 1805.

"A man, about 70 years of age, has been troubled for twenty years (the disease began when he was fifty) with a frequent Inflammation and suppuration in the posterior part of the Fauces, upon the right side; so frequently indeed, that scarce three months ever elapsed without a severe attack of it. During the intermission, the patient found an uneasiness in the spot, which, he was taught to believe, proceeded from an enlargement of the Amygdala. I saw him about five weeks ago; his throat was then highly inflamed and swollen, more especially on the right side, from whence the Tumour stretched almost entirely across to the opposite side. I used the common remedies without the smallest benefit. At last, after twenty years suffering, the Tumour burst, when, besides a puriform discharge, a Concretion came away."

CASE II.

"Ann Welsh, æt. 58, sister of the former patient, was affected, after exposure to cold, with symptoms like those of Cynanche Tonsillaris, with swelling externally as well as internally; pain in Throat, darting towards the Ears, more especially to the left; difficulty of breathing and deglutition. The Tumour burst in three weeks, and a good deal of pus was discharged, and the ulcer healed in ten days. Two months had scarcely elapsed when the patient was again seized with similar symptoms, in consequence, as she thought, of getting wet feet. The attack terminated in a similar way as the former.

"She had afterwards frequent attacks of inflammation and suppuration after exposure to cold.

"From the commencement of her complaint, she thought she felt A LUMP on the left side of her throat, and this by degrees increased; so that, in about a year afterwards, the skin was seen protruded before it at the upper part of her Throat.

"The next attack was more violent than the preceding; the tumour gave way, and matter was discharged; the pus continued to be discharged through eight small apertures, and continued open for about twelve months. At the end of this period, being about three years from the commencement of the attack, I perceived, by the probe, a Concretion in the Tonsils. I made an incision into the tumour, but so much blood was lost that the patient

fainted; so that I could only break off a portion of the Calculus. By the use of emollient gargles for fourteen days, the cyst gave way, and the Calculus was discharged into the mouth. The ulcer then healed rapidly.

"In both of the preceding cases, the attacks of inflammation and suppuration were at first extremely frequent, but the sores healed readily. But as the disease advanced, matters were reversed, the intervals of ease were longer; but the cure of the ulcers was more protracted.

"The sores seldom remained open above four or five months. The patient, whose case has been first described, laboured under the disorder for twenty years, and, during the last attack, the Throat was not in the slightest degree inflamed."

The same gentleman communicated to me the history of a Third Case, which continued for about three years, when a stone, about the size of a bean, was discharged. It was remarkable that this person was a relative to the former patients.

The Calculus which had been lodged in the Tonsils, which KENTMANNUS has described, was, in some respects, similar to those which were sent to me.

He describes it as "gypseum, simillimum tophis, qui intra digitorum articulos chiragra laborantibus accrescere solent."

There is no mention made of any chemical Experiment having been made upon the Calculus.

The three Calculi sent to me were of the same pyriform shape, unequal on the surface, which was of a dirty olive colour, and which seemed to have been owing to the pus, in which the Calculi had been so long imbedded, having dried upon the surface of the Calculus, and to the touch somewhat harder than chalk. Internally the Calculi had a dirty opaque white colour, which, towards the centre, was slightly tinged by yellow, and towards the circumference with a dirty green colour; and the section exhibited a few concentric layers of a more brilliant white colour than the rest of the Calculus, but no central nucleus. By the aid of a magnifying glass, the Calculi seemed to be composed of small grains agglutinated to each other.

I have subjoined a more particular account of the Calculi, drawn out according to the manner of Werner, by Professor Jameson, and the chemical analysis of one of these Calculi by Dr Thomas Thomson.

Colour of the surface dirty olive green, internally greenish grey towards the surface, but yellowish grey in the centre.

Shape, pyriform.

Surface, granulated, inclining to botroydal.

Lustre dull.

Fracture even.

Concretions, curved lamellar concretions.

Transparency opaque.

Hardness, yields to the Nail.
Tenacity, sectile inclining to brittle.
Specific Gravity 1.715.

Constituents.

1. A white matter retaining the size of the Calculus, and swimming in water. It possesses the properties of coagulable albumen.
2. Phosphate of lime.
3. Carbonate of lime.

It differs in its composition from any salivary calculus hitherto examined. But pulmonary calculi of a similar kind are common.

SECTION IV.

Of the Effects of Arsenic.

It is a happy circumstance for mankind that the more subtile poisons are not generally known. Those which the wicked or unfortunate have recourse to are few in number; and their effects being sudden and obvious, detection almost certainly follows the commission of the crime.

To those persons who have taken poison by accident, or to those still more unhappy people, whose insanity or misfortunes have driven them to make attempts on their own lives, the only consideration of importance is, in what manner the fatal effects of the poison may be obviated.

The effects of arsenic, when taken in its metallic state, or as an Oxyde, are extremely different, the latter being highly poisonous.

We are well acquainted with the effects of some of the Oxydes of Arsenic, but not with those of the metal itself*, or with those of the artificial Sulphurets of Arsenic, which led me to make the following Experiments with arsenic in its metallic state, and also with the artificial Sulphuret.

I was fully aware of the rapidity with which the metal is converted into an Oxyde by exposure to the air, and therefore endeavoured to provide against that in making my Experiments, by breaking down large pieces of the Metallic Arsenic (which Professor Briggs of St Andrew's prepared for me, by sublimation from the white Oxyde of the Metal,) and immediately mixing it with the extract of Gentian; and as soon as the mixture was made, gave it to the animals.

Experiment 1.

I gave a dog, which I had kept fasting for twelve hours, two grains of the metallic arsenic in fine powder, mixed with the extract of Gentian. The only ef-

* Mr Renault did not make experiments with the metallic arsenic, because, he observes, "Ce n'est pas qu'il soit difficile d'obtenir l'arsenic pur et complètement dépouillé d'oxigène; toute la difficulté gît dans la promptitude avec laquelle il enlève ce principe à l'atmosphère, ce qui rend extrêmement incertaines les expériences que l'on tente avec ce métal sur les animaux vivans."—Vid. Experiences sur les contre poisons de l'arsenic, p. 41.

fects of it were a slight purging, of a stale-coloured matter, and the discharge of a GREAT DEAL OF URINE.

Experiment 2.

Four grains of the metallic arsenic, mixed with the extract of Gentian, were given to a dog, that had been kept without food for twelve hours, involved in a piece of boiled beef.

In the course of two hours, the dog vomited a quantity of a dark slate-coloured matter, which, being hungry, he licked up and swallowed.

Five hours after the metallic arsenic had been taken, I saw the dog; he then seemed quite well.

About an hour afterwards he became very sick, and vomited up a good deal of bilious-looking fluid, and had also a slight bilious purging; after which he ate a quantity of boiled beef.

Dr DUNCAN Jun. was so polite as to examine the metallic arsenic I had used in this experiment, and was of opinion that it was very slightly oxydated. I therefore repeated the above experiment, and, for the purpose, selected several large pieces of the metallic arsenic; reduced these into a fine powder, and immediately gave four grains to a dog. The arsenic produced no other sensible effect, excepting occasioning a very considerable DISCHARGE OF URINE.

Experiment 3.

Six grains of metallic arsenic, in powder, were given to a dog; but they produced no obvious effect,

From the above experiments, it follows, that the metallic arsenic may be taken by a dog with impunity, to the extent of several grains.

Experiment 4.

Ten grains of metallic arsenic were given to a middle-sized dog, mixed with the extract of Gentian, at three o'clock P. M. At five o'clock, the animal seemed but little affected.

At seven o'clock, P. M., severe vomiting and purging of a bilious fluid had come on, which continued for several hours.

He passed a great deal of Urine; the pulse became extremely quick and feeble.

Next day, at one o'clock P. M., I saw the dog; his pulse was so very quick that I could not count it, and also very feeble.

He seemed extremely weak, and refused every kind of food; and I thought he would have died.

On the following day he was much recovered, and took food; and on the next day seemed quite well.

Experiments with the Black Oxyde of Arsenic.

This oxyde is prepared by exposing the arsenic in its metallic state, when broken into very small pieces, to the air for some time.

Mr Renault's experiments upon this oxyde have proved the very poisonous effects of it.

It is certainly very remarkable that this substance should be so extremely poisonous to animals, even

when the quantity of oxygen it has gained is so trifling as hardly to add to its weight.

I requested Mr GRAHAM to repeat Mr RENAULT'S experiments with this oxyde, and to attend particularly to the state of the pulse, and to its effects upon the digestive and urinary organs.

He has favoured me with the following report, which I have subjoined in his own words.

" Having procured two dogs, I gave to one of them two grains, and to the other one grain of the black oxyde of Arsenic; and having confined them in separate apartments, at eight o'clock in the morning, I did not examine them again till twelve. Their Natural Pulse was in the former seventy-six, in the latter eighty-two.

" At twelve I found that vomiting and purging had now come on in the former of these, the nature of which appeared to me to consist principally of Bile, often mixed with Blood; indeed the latter was sometimes voided almost pure; frequent frothing at the mouth, of a bloody hue.

" Pulse one hundred and thirty, small, hard, and very irregular; shiverings in a short time began to affect the animal, which continued, with very little abatement, till death, accompanied with frequent moaning: the eyes were inflamed, but very much sunk. At this time I observed an increased secretion of Urine, rendered evident by an incessant discharge from the bladder, of a dark colour, and emitting a very offensive odour.

" At Two I found the animal nearly in the same

state. The vomiting and purging had increased both in severity and frequency; it expressed the greatest anxiety; respiration was performed with difficulty; pulse one hundred and forty or upwards, small, thready, and often intermitting.

"At four o'clock I again saw it: The limbs were now affected with Tremors and Cramps; the vomiting and purging had now almost ceased; low delirium and insensibility had now supervened. Pulse scarcely perceptible. The increased discharge of urine still continued, which seemed to be involuntary. In a short time after the dog expired.

"Upon dissection the following phenomena were observed:—

"The Pharynx, and superior part of the Œsophagus were inflamed, and much corroded, and covered with a viscid, glairy mucus *. The Gall-Bladder was enormously distended with recent Bile. The Kidneys exhibited appearances of inflammation. The Bladder of Urine I found containing an immense quantity of urine, of a very dark colour, and of a very offensive smell. None of the Thoracic Viscera were affected, nor was the Brain.

"One grain of this Oxyde seemed at first to

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* Mr Graham sent me the Stomach and Intestines of the dog, which I examined with care, and found quite empty, and prodigiously contracted. There were no marks of Inflammation in the Villous coat of the stomach or Intestines, which was covered by a very tenacious mucus.

have very little effect upon the dog. Natural Pulse, at the beginning of the experiment, eighty-two, full and strong.

" At twelve, pulse an hundred. A teasing nausea tormented it, which was generally alleviated by a discharge of Bile. Purging, though it was seldom, appeared to be chiefly of mucus and bile. No shiverings were produced, but considerable moaning. In this animal, too, the discharge of urine was increased to an astonishing degree, but of a darkish hue, and disagreeable smell. At two, many of these phenomena had disappeared. Pulse eighty-four, weak; purging almost gone, as was the nausea; but the discharge of urine still continued to be preternaturally augmented, though it was now of a more natural colour and odour. At this time I presented him some food, which he devoured with avidity, and seemed to be much relieved, as at four o'clock there did not seem to be any unnatural symptom, debility excepted."

These experiments shew the very highly stimulating properties of this Oxyde of Arsenic upon the Gullet and Secretory Organs.

The white Oxyde of Arsenic is more commonly employed as a poison; and it proves fatal, even in small doses.

It has been proved by repeated observation, that two grains of this Oxyde prove fatal to man in a short time.

When taken in any considerable quantity, it pro-

duces the most violent inflammation of the inner coat of the Gullet and Stomach, which is rapidly followed by gangrene, which, as two preparations in the Museum of Edinburgh shew, is not limited to the internal surface of the stomach, but which extends to all the coats of that organ.

Upon opening the Stomach, we sometimes meet with the poison adhering to the Villous coat of the Stomach, and the Arsenic is found in its metallic state.

According to Dr Baillie, the Stomach is sometimes lined by coagulable lymph.

In some cases, the Stomach has been eroded; and these erosions differ materially from those occasioned by the Gastric Juice, or by most species of Ulceration; for they resemble the perforations made by a pointed instrument, and are surrounded by inflammation.

The Villous coat of the small intestines has been in some cases found inflamed and thickened.

Of the symptoms occasioned by the White Oxyde of Arsenic being swallowed.

When a considerable quantity of this poison is taken, the Tongue swells, a sensation of burning extends along the Gullet, which is followed by a sense of constriction in that canal, acute pain in the Stomach and Bowels, which is aggravated by pres-

sure, and vomiting and purging, of a very viscid ropy mucus, which is in many instances tinged by blood, and which continues in many cases for several hours.

The Pulse is quick and irregular, and in a few hours becomes still quicker, and more irregular.

The Breathing is also much affected; it is laborious, and the pulse now becomes slow. Convulsive twitchings of the muscles of the limbs, faintings, cold sweats follow, which are the precursors of death; which in some cases has taken place in four or five hours after the poison has been swallowed.

Wepfer* has described the case of a boy who died in two hours †.

There is, however, much variety as to the time in which arsenic proves fatal, as that depends upon the quantity of the poison which has been taken,

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* Vid. Cicut. Aq. Hist. c. xxi.

† As a striking proof of the small quantity of the white oxyde of arsenic by which some constitutions are affected, it may not be improper to add, that I lately visited a gentleman who had mixed up with his pen-knife some of the white oxyde, as a poison for rats. He had not wiped the blade of the knife with so much care as to remove the arsenic from the groove in the blade, which is left for assisting us in opening the knife. The same day, after dinner, he cut an orange with the same knife; in the evening he became extremely sick, and continued so during the whole night; he was also thrown into a violent sweat.

whether the poison is in the metallic state, or oxydized, and also upon the age and constitution of the individual.

In general, twenty-four or thirty hours elapse before it proves fatal, as vomiting generally takes place; and from thirst, and heat in the Gullet and Stomach, the patient drinks largely, which dilutes the poison.

In short, the symptoms occasioned by this mineral are similar to those of very acute inflammation of the Stomach and Intestines, which is very rapidly followed by gangrene.

In other instances, arsenic produces a great degree of Spasmodic Contraction in the Cardia, which prevents the patient from vomiting, though he is harassed by an excessive sickness; and the stomach thereby becomes so much distended by air, as in some instances to be in great danger of bursting; and when an instrument is introduced, in order to drain off the air, it rushes out with a loud sound.

Arsenic, when given in a dose not sufficient to destroy life, generally produces effects that render death desirable; such as constant pain in the Stomach and Bowels, and Tremors, which terminate in Palsy and lingering hectic *.

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* Vid. also a very instructive case drawn up by Du Haen, Ratio Medend. Vol. III. p. 113.

Some patients who have survived the taking arsenic, are afflicted with ill-conditioned Ulcers.

Even the fumes of this mineral are deleterious *.

Arsenic produces, in manufactories, in which the labourers are exposed to its fumes for many years, the greatest degree of emaciation.

Copper produces nearly the same effects as the White Oxyde of Arsenic, as we sometimes have occasion to observe, when food is prepared in Copper vessels that are imperfectly coated by Tin †.

The external application of the white Oxyde of Arsenic is not unattended with danger; for, when applied to an extensive Cancerous sore, in the form of ointment or solution, it occasions acute lancinating pain, attended by giddiness, great thirst, quickness of pulse, cough, general anxiety, and difficult breathing ‡.

Mr Renault found, that when applied to the skin of a dog which had been divided, it sometimes proves fatal §.

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* Vid. Van Swieten, Comment. Vol. II. p. 715.

† Vid. Blane's Diseases of Seamen, p. 298. Percival, Med. Trans. Vol. III. p. 80.

‡ Dr Mead, in his Treatise on Poisons, has made mention of a case in which the external application of arsenic proved fatal.

§ Vid. also Crantz, Mat. Med. Tom. III. p. 25.

In the Leipsic Comt. for 1793, Vol. XXXV. p. 242, there is a case mentioned, where arsenic, applied to the Vagina, created almost immediate sickness, and death in twenty-four hours.

Experiments with the artificial Sulphuret of Arsenic.

Mr Renault has made mention of several Experiments which he made with the artificial and native Sulphurets; the former of which he found poisonous, but not the latter.

But Mr Renault has left us in the dark as to the precise proportions of Sulphur and Arsenic in the artificial Sulphuret which he employed *, a circumstance which was worthy of notice, as the artificial Sulphurets contain very different proportions of Arsenic and Sulphur.

I therefore thought it not improper to make Experiments with a sulphuret, containing equal proportions of Sulphur and Arsenic, and which was prepared for me by Professor Briggs.

Experiment 1.

I gave to a middle-sized dog, that had been kept fasting for twelve hours, six grains of the artificial Sulphuret, made into Pills with the extract of Gentian, involved in a piece of boiled beef. The dog being hungry, readily swallowed the boiled beef,

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* He thus describes it:—"Celui dont je me suis servi, formait un aggrégé homogène et cassant, dont la couleur jaune était très pâle; il répandait, en brûlant, l'odeur d'arsenic et celle d'acide sulfureux." Vid. Exp sur contre Poisons de l'Arsenic, p. 57.

and did not seem to have been affected in the slightest degree.

Experiment 2.

Mr GRAHAM, at my request, gave a dog twelve grains of the same artificial Sulphuret, made into Pills. The dog vomited, and discharged, by purging, a good deal of a bilious-looking fluid for three hours.

Experiment 3.

I gave eighteen grains of the artificial Sulphuret of Arsenic to a middle-sized dog. The animal, in the course of two hours, became extremely sick, and vomited and purged violently, and also passed a *great deal of Urine*, and it continued extremely sick for about five hours.

On the day following, it refused food.

The next day, however, it seemed quite well.

This experiment was repeated by Mr GRAHAM, and the result was similar.

The results of these Experiments are extremely different from those made by Mr RENAULT with the artificial Sulphuret, who informs us, that he killed a small dog by giving it four grains, and a larger dog by giving it three grains *; or of PLENK †, who gave 3i of orpiment without killing the animal.

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* Vid. Exp. sur contre Poisons de l'Arsenic, p. 57.

† Vid. Plenk de Venenis, p. 276.

SECTION V.

Of the Effects of Opium.

The frequent, and often salutary use of Opium as a Medicine, has rendered us familiar with it, and well acquainted with its operation in the animal economy.

Different opinions have been entertained respecting its mode of action; but as this subject is foreign to the present inquiry, I shall content myself with stating, that, according to Dr Whytte, it affects the body by the medium of the Nerves only; but, according to Fontana, by the medium of the Blood.

My Father's numerous experiments upon Opium, have led him to a different conclusion. He supposes, that Opium not only affects the Nerves, to which it is primarily applied, but is also absorbed; and being then mixed with the blood, proves fatal, by its sedative powers upon the Nerves of the heart, and Blood-vessels, and the whole Nervous System *.

In the case of a young woman who had destroyed herself by drinking a wine-glass full of Laudanum, I observed a number of small red spots upon the Villous coat of the Stomach.

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* Vid. Edinb. Med. & Phys. Essays, Vol. III. p. 292.

When Opium, or its tincture Laudanum, has been swallowed in a large quantity, it generally produces the following symptoms: Vertigo, torpor, slow and full pulse; breathing at first quick, difficult, and stertorous, and it gradually becomes slower, so that there is a distinct intermission between the Inspirations.

The Pulse gradually becomes more feeble, and slower, as the breathing becomes slower.

The patient falls into a profound sleep, from which he does not awake, and dies apoplectic, and sometimes is much convulsed.

In other cases, vomiting takes place, and the patient becomes afterwards paralytic.

When, from the symptoms, there is reason to suspect that Arsenic or Laudanum has been swallowed, an emetic should be given as soon as possible; as the former very soon proves fatal, and the latter destroys the sensibility and muscular action of the Stomach, and impairs the energy of the Brain and Nervous System in a very short time.

In cases of this description, the choice of an emetic is of the utmost consequence. That which operates most expeditiously is to be preferred, as a few minutes sooner or later may decide the fate of the patient. There is no medicine which answers this purpose so well as the Sulphate of Zinc, it being the most expeditious, as also the most certain emetic that I know, generally exciting vomiting in a minute or two; and in some instances it succeeds

after the Tartrite of Antimony or Ipecacuanha have failed of producing the desired effect. As the Sulphate of Zinc is readily dissolved in a small quantity of water, it should be given in solution, in the dose of ℈i. to ℥ss.; for giving it in a bolus does not answer so well.

There are two cases described in my Thesis, De Dysphagia, which shew the salutary effects of vomiting when a large quantity of opium has been swallowed.

"Pater meus hominem vidit, qui ex permagna opii dosi stupore afficiebatur; superstite tamen sorbendi facultate, (res boni ominis,) quique post portiones emeticorum zinci vitriolati et antimonii tartarisati, quæ vomitum citò motum in duas horas protraxerunt, convaluit.

"Dominus Macaulay exemplum juvenis a se visi, qui ℥ii opii devoraverat, mecum communicavit, quique remediis similibus usus convaluit." But large doses of Laudanum, even when vomiting has been artificially excited, in the course of two or three hours, sometimes leave a numbness or palsy of one of the arms or legs.

I also published a third case, in which an attempt was made, after the power of swallowing was lost, to save the patient, by injecting diluents into the Stomach, and by them extracting the contents of the Stomach.

"Vir robustus, paroxysmis hysteriæ similibus obnoxius, paroxysmo finito, vini Gallici cyathum su-

mere solebat; sed, errans, cyathum laudani liquidi plenum exhausit.

" Paulò pòst, errore cognito, vomitum frustrà ipecacuanhâ et antimonio tartarisato movere conatus est.

" Æger, horâ undecimâ A. M. opii tincturam sorsperat; eumque post tres horas elapsas visebam: tum comate laboravit, pulsusque arteriarum circiter quinquagies minuto horæ primò micabant, et clarè stertebat.

" Postquam ita parumper permanserat, vehementissimè exclamavit; et dein convulsionibus correptus fuit, spumâ ex ore fluente.

" Vomitum, ob œsophagi ventriculique sensum abolitos, moveri nequivit.

" Quò laudani effectus leniores essent, ei in ventriculum, instrumento in Tab. XIV. depicto, permagnam aquæ tepidæ quantitatem injeci, faucibus simûl per oris speculum diductis.

" Paulò pòst enema stimulans per anum injectum fuit; et vesicatorio ventriculo, et cataplasmatibus sinapi utrique pedi impositis, abii.

" Horâ P. M. octavâ, eum mortuum reperi."

Though the result of this trial was not such as might have been wished, still it sufficiently shewed, that, in more favourable circumstances, when the means of relief are employed a short time after the opium had been swallowed, that life may be saved by such means; and I was much gratified by observing, that Mr Renault has recommended the

use of an apparatus, somewhat similar, to obviate the fatal effects of Arsenic.

The above experiments prove that the Sulphur mitigates, though it does not destroy the deleterious effects of Arsenic; and hence the necessity, when Arsenic has been swallowed, of prescribing emetics when the irritability of the Stomach remains, or of introducing an instrument into the Stomach, with the view of diluting or throwing the antidote to the poison into the Stomach, and afterwards extracting the poison after the power of swallowing and vomiting are lost.

I have therefore subjoined the description of the apparatus for injecting liquids into the Stomach, and then withdrawing the contents of the Stomach, which I published in my Thesis, in 1797.

" Instrumentum describam, a Patre meo, ante triginta abhinc annos, excogitatum.

" Hoc instrumentum utre magno, e gummi elastico fabricato, constat; cui tubus longus flexilis inseritur, cujus in ore epistomium intercludens ponitur. Tubi hujus diameter quadrantem pollicis, ejus longitudo novemdecim aut viginti pollices, æquat.

" Hic tubus, quo faciliùs flectatur, e lamina argentea, in formam spiralem contorta, fabricatur, corioque mollissimo tegitur.

" Quo a tubi flexura nimia dum detruditur, præcaveatur, ejus partem quoque constituit filum æneum crassum per eum transiens, supernè reflexum,

ne in ventriculum decidat, ac mucrone conico munitum, ne tubus œsophagum lædat.

" Priusquam adhibeatur instrumentum, oleo vel axungiâ porcinâ illinatur oportet.

" In Actis Chirurgicis, Londini editis anno 1793, J. Hunter, instrumentum quodammodo simile, his verbis descripsit:

" The instrument made use of, was a fresh eel skin, of rather a small size, drawn over a probang, and tied up at the end where it covered the sponge, and tied again close to the sponge, where it is fastened to the whalebone; and a small longitudinal slit was made into it, just above this upper ligature.

" To the other end of the eel skin was fixed a bladder and wooden pipe, similar to what is used in giving a clyster, only the pipe large enough to let the end of the probang pass into the bladder without filling up the passage. The probang, thus covered, was introduced into the stomach, and the food and medicines were put into the bladder, and squeezed down through the eel skin. An eel skin seems very well adapted for this purpose, being smooth, pliable, and readily passed into the stomach; but as cases of this kind may occur where eels cannot be procured, a portion of the gut of any small animal, as a cat or lamb, will make a very good substitute.

" J. Hunter posteà dicit, ' that this instrument did not produce irritation;' nec ex instrumento a Patre meo proposito irritatio facta est. Hoc verò

omnibus in exemplis minimè verum est, in exemplo enim ab AIRD tradito *, res aliter se habuit.

" Animadvertendum est quoque, re aliquâ in guttur fortiter impulsâ, vomitum non æquè facilè ac eadem partes tantùm leviter titillante, excitari.

" Horum instrumentorum alterutrum feliciter adhiberi potest, aut œsophago spasmo aut paralysi laborante, aut veneno in ventriculum recepto.

" Instrumentum verò priùs descriptum, huic usui, alterio melius inservire videtur; illo enim remedia, leniendi veneni symptomata causâ, in ventriculum injecta, per utris resilientia latera extrahi possunt, minimè verò per hoc a J. HUNTER propositum.

" Instrumentum tale quoque ultissimum est materie acri in ventriculum admissâ, aut aëris enormi copiâ ex fermentatione ibi nata, sicut in animalibus ruminantibus, frugesque succulentas devorantibus, contingit.

" Aëre enim irritatur ventriculus, constringitur œsophagus, et, perstante fermentatione, ventriculus ita tandem distenditur, ut mors sequatur †.

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* Vid. Edin. Med. Essays, Vol. I.

† Mr E. Home has observed, London Phil. Trans. for 1807, Part II. page 143, " The functions of this membrane (the Villous coat of the Stomach) could no more go on, were it unfolded to a great extent, than the muscular actions of the outer coat, in an overstretched state of its fibres. In proof of this observation, I have known an instance of a child three years old, who being

" Aër autem ibi inclusus, per tubum flexilem in ventriculum detrusum, certissimè emitti potest.

" Pater meus, in scriptis res novas continentibus, (Anglicè *newspapers,)* rationem edidit, qua aër e ventriculis animalium ruminantium distento, removeatur. Verba ejus hìc loci referam.

" The swelling of the belly is owing to the distention of the stomach, and particularly the first stomach, by fixed air or carbonic acid gas, which is disengaged from the tender and succulent grass, in consequence of its quick solution and violent fermentation; while the discharge of it upwards, through the gullet, seems to be prevented by a spasm or muscular contraction of the upper orifice of the stomach. The dangerous and other fatal effects which follow the distention, are not owing to the fixed air, or the juices of the fermented grass, acting as poisons upon the stomach, as a moderate quantity of either produces no bad effects; besides, the repeated experience of the grazier has shewn, that many cattle are immediately relieved and preserved, by stabbing them with a knife or trocar, or by forcing a rope down their throats, and thus allowing the air to escape.

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left alone at dinner, ate so large a quantity of apple-pudding, that it died, which raised suspicion of its having been poisoned. On examination after death, the whole Stomach was distended to its utmost extent, and rendered quite tense, which was the only apparent cause of the child's death.

"Cattle, therefore, may with certainty be saved, if the air be drawn off in due time, without injuring the stomach or bowels; and this may easily be done, by passing a flexible tube, from the mouth, down the gullet, and into the stomach.

"This tube is to be composed of an iron wire, much larger than a common stocking-wire, or about one-tenth part of an inch in diameter. In order to give it the cylindrical form, it is to be twisted around a thick rod of iron; and, after taking it off the rod around which it was turned, it is to be covered with smooth leather.

"To the end of the tube, which is intended to be passed into the stomach, a brazen pipe, two inches long, of the same size as the tube, and pierced with a number of holes, is to be firmly connected.

"To prevent the tube from bending too much within the mouth or gullet, in time of passing it down into the stomach, an iron wire, one-eighth of an inch in diameter, and of the same length as the tube, is put within it, which is to be withdrawn when the tube has entered the stomach.

"The space from the fore-teeth to the bottom of the first stomach of the largest ox, measures about six feet; the tube, therefore, ought to be six feet long, that we may be sure of its answering the largest oxen.

"And to prevent the tube from being injured while it is introducing, a speculum oris, of a large size, the under plate of which is one foot long, and

three inches broad, and the screw which separates the two plates about six inches in length, should be previously put into the ox's mouth, that his tongue may not come in the way, and that he may not crush or break the tube with his teeth.

"After the tube is passed into the stomach, it may be allowed to remain within it for any given length of time, as, when it is pressed to one side of the throat, it does not interrupt the breathing of the animal.

"The greater part of the elastic and compressed fixed air will pass through the tube, and, if it be thought necessary, the remainder of it, or the superfluous drink, may be sucked out by bellows fixed at the upper end of the tube, with a couple of valves, one at its muzzle, and the other in the side of it, so disposed as to allow the air to pass in the direction outwards.

"And it is material to add, that Mr WALKER * has saved the lives of many sheep, as well as black cattle, by using this instrument; and, from a late publication †, it appears, that this is a matter of much moment, and well worth the attention of the farmer, as a great proportion of sheep, not less than one-fifth of the whole flock, sometimes perish from this cause.

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* Walker on the Diseases of Cattle.

† Naismyth on Sheep.

"It is also evident, that ardent spirits, or any other fluid fit for checking fermentation, or other substances which may be useful in other respects, can be injected through such a tube; also, the air is not only more certainly discharged than by stabbing the animal, but the danger is avoided which the stabbing occasions, not so much by the irritation which the wound creates, as by the air, and other contents of the stomach, getting into the cavity of the belly, between the containing parts and the bowels, exciting such a degree of inflammation as frequently proves fatal to the animal*."

I have already observed, that this instrument may also be employed in cases of Spasm and Stricture of the Gullet; and in my Thesis I have published a case illustrative of this point.

"Insigne, puellæ, J. Matthew, œsophagi spasmo vexatæ, exemplum, in Nosocomio nostro, ineunte anno 1792, se obtulit.

"Hæc puella, viginti annos nata, paroxysmis epilepticis, paralysi cruris alterius, dysuriâ, et imperfecto alterius oculi visu, laborabat. Paulò pòst, devorandi facultate minutâ, musculorum gutturis et brachiorum spasmi superveniebant: tandèm, devorandi facultate penitùs abolitâ, ægra eandem exercere conata, convulsionibus violentis correpta fuit.

* Since the above was published by my Father, the instrument has been found of so great benefit by farmers, that it has now come into universal use.

Morbi initio, enemata nutrientia data fuerunt. Eodem autem ingravescente; compertoque stylum cetaceum facillimè, per œsophagum transire, cel. Dr RUTHERFORD * cibum ægræ in ventriculum injiciendum curavit, ope tubi in pag. 77. descripti.

" Hoc modo, vita J. MATTHEW biennium et octo menses protracta fuit.

" Tubus in ventriculum bis vel ter indiès, neque dolore neque molestiâ insigni excitatis, detrusus fuit. Tandèm devorandi facultas rediit. Primò liquidâ, idque parvâ tantùm copiâ, sorbere potuit: triennio jam labente, cibos solidos consumere valet.

" Adhuc tamen dysphagiâ levi, brevi autem fugiturâ, subindè laborat."

It may not be improper to add, that the same instrument may be used for the removal of stricture of the gullet.

My Father was consulted, along with Dr CULLEN, in the case of a gentleman who was a patient of Mr MEEK, Surgeon in Falkirk, who had not been able to swallow, even liquids, for three days before he applied for relief, on account of a stricture in the gullet. My Father introduced the flexible tube into his patient's stomach, and injected soup through it during his residence in Edinburgh. Upon the patient's return home, my father gave him a letter to

* Dr Rutherford borrowed for the purpose my father's apparatus.

Mr MEEK, and proposed to him to attempt to destroy the stricture, by passing caustic through the tube; but what was recommended was not followed, and the patient died from inanition about three months afterwards.

SECTION VI.

Of the Effects of the Concentrated Mineral Acids.

THESE act as Caustics.

I have had an opportunity of observing the effects of them, when swallowed by accident or design.

Dr GREGORY sent me, a few years ago, the greater share of the gullet of a young woman, who had taken a quantity of Sulphuric Acid; the gullet was discharged in a black and gangrenous state, fourteen days after the acid had been swallowed.

The same acid was given to a child, and proved fatal in a few hours. Upon examining the Stomach, it was prodigiously inflamed, gangrenous in some places, and eroded in others.

It may not be improper to add that, according to MORGAGNI, the long continued use of strong vinegar sometimes occasions scirrhus of the Alimentary Canal.

CHAPTER III.

CLASS II.

OF THE ORGANIC DISEASES OF THE COATS OF THE ALIMENTARY CANAL.

SECTION I.

Celsus, in treating of the method of studying Medicine, has strenuously recommended the frequent and attentive inspection of morbid bodies. "Utinam liceret," (says he) "sæpius defunctorum Cadavera scrutari! quot non detegerentur latentes morborum causæ!"

The above observation is peculiarly apposite to the investigation of the organic diseases included in this Chapter, which, though constituting one of the most interesting and extensive branches of

Morbid Anatomy, has not hitherto been investigated in all their details or relations; and hence this department of Morbid Anatomy is still much involved in obscurity.

Pathologists have not marked, with sufficient precision, the distinction between those organic derangements, which are common to all the coats of the Alimentary Canal, and those which are originally proper to each of them, and in which all the coats are at length implicated.

To detect the origin, and to trace the progress and manner in which organic diseases are propagated, is a very difficult, though very important, task, and requires much patient research, and also the experience of many cases of the same description.

Those authors who have enjoyed but a limited sphere of observation, have rather retarded than accelerated the progress of Morbid Anatomy, by publishing imperfect descriptions of the effects of organic diseases; and, by giving a partial view, have, in many cases, contradicted each other, each having presented to his reader a different portrait of the same organic derangement.

Distrusting the results of partial observation, I have endeavoured, by a careful examination and comparison of various specimens of the Organic derangements, which are preserved in the large Museum of Morbid Anatomy, which has been formed by the industry of my Father, "to correct (as Sir

J. Reynolds has recommended) what is erroneous, to supply what is scanty, and to add, by my own observation, what the industry of my predecessors may have yet left wanting to perfection."

Such is the only method, by which the mysterious veil which envelopes the history of many organic derangements can be removed. At the same time, I have availed myself of the large and very useful store of pathological information which is contained in the works of Morgagni, Dr Baillie, Portal, and others, who possessed ample means of information, and are capable of guiding me in new and useful paths. "Possessing (as Mr Cuvier has observed) no demonstrated principle, whence the particular facts might be deduced as consequences, the whole science, as yet, consists in the series of these facts only; and we cannot hope to discover general causes, but in proportion as we may be able to class the facts, and succeed in arranging them under certain common laws."

The Alimentary Canal extends from the mouth to the anus; and consequently a treatise upon the Morbid Anatomy of this part of our frame may be supposed to include the history of the organic derangements of the Tongue, Teeth, and Salivary Glands, which contribute to the function of digestion.

But such an investigation would be extremely extensive. It is therefore proposed to limit the attention of the reader to the organic derangements of

that part of the Alimentary Canal which is included between the Pharynx and Rectum.

There have been two very different plans followed by authors, in treating of this subject. By the one, all the organic diseases of the Pharynx and Gullet are described under one head; those of the Stomach under a separate head, and those of the Intestines under a third head. But such a plan seems to me liable to many well-founded objections.

By the other plan, the organic derangements of the Villous Coat of the Pharynx, Gullet, Stomach, and Intestines, are explained in one chapter; those of the Cellular Coat in a second; those of the Muscular Coats in a third; and those of the Peritoneal Coat in a fourth chapter: or that mode is pursued, which Dr C. Smyth has adopted in his excellent Essay upon the Different Kinds of Inflammation *.

There are many advantages peculiar to this mode of prosecuting Pathological inquries.

It points out how far organic diseases are modified by the structure, function, and situation of the part affected; and it saves much unnecessary repetition in the description.

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* In the Class II. viz. Phlegmasies, of the Nosographie Philosophique of Pinel, and in the Traité des Membranes of Bichât, the arrangement and sentiments of Dr C. Smyth upon the different kinds of Inflammation, may be traced.

This method of distributing the subject into parts, is not artificial and arbitrary, neither is it unnatural; for it has an immediate reference to the manner in which many organic derangements take their origin; these being limited at first to one of the coats of the Alimentary Canal, and being propagated to the other coats only in consequence of their continuance. It is founded, therefore, upon the principles of philosophical induction.

This view of the subject suggests a corresponding division of the symptoms, viz. into those which are general, and characteristic of all the organic diseases of parts of a similar structure; and into those which are accessory, and which originate from the peculiar function and situation of the part affected. "The great difference of the symptoms," says Dr C. Smyth, "is more owing to a difference in the function of the part inflamed, than to any specific difference in the nature of the inflammation, which, in most instances of visceral inflammation, is nearly of the same kind; terminates in the same manner; and requires the same general treatment *."

Lastly, this method of investigating the organic diseases of the Alimentary Canal, may tend materially to the improvement of Pathological Anatomy, by directing and fixing the attention of future in-

* Vid. Lond. Med. Communic. Vol. II.

quirers upon the origin and progress of Organic Derangements, may serve to point out those general principles which should be pursued in the treatment, and may introduce a new and more effectual means of eradicating the disease, or of arresting its progress, which is peculiarly adapted to the nature of the case.

From what has been stated, it is proposed to adopt the following arrangement, in treating of THE ORGANIC DISEASES OF THE ALIMENTARY CANAL, which may perhaps be included in the following enumeration:

Of the Organic Derangements of the Villous Coat of the Alimentary Canal.

Inflammation, Thickening, Ulceration, and Gangrene.
Ulceration and Erosion, from Dysentery.
Milt-like Tumour.
Polypi.
Sarcomata.
Fatty Tumours.
Fungous Tumours.
Hæmorrhoids.
Varicose Tumours.
Strictures, where the other coats are not affected.
Projecting Ring of Dr BAILLIE.
Aphthae.
Small-pox Pustule.

Deposition of Cartilage.
Formation of Bone.

Of the Organic Derangements of the Cellular Coat.

Phlegmon and its consequences.
Albuminous Tumour.
Diseases communicated, which originate in the other coverings of the Alimentary Canal.

Of the Organic Derangements of the Muscular Coats.

Inflammation and its consequences.
Spasm.
Palsy.

Of the Organic Derangements of the Peritoneal Coat.

Inflammation, Effusion of Coagulable Lymph and Serum, Adhesion, Ulceration, Gangrene.
Small Tumours, commonly called Scrofulous.
Ossification.

Of the Organic Derangements of all the Coats.

Inflammation, and its effects.
Stricture.
Scrofula.
Coats converted into pulpy matter.
Induration of the Coats,

Extension into pouches.
Rupture.

Of the Organic Derangements of Mucous Glands.

Inflammation and its consequences.
Scirrhus and Cancer.

Lastly, the Alimentary Canal is frequently thrown into a morbid state, by the spreading of the organic diseases of those organs which are in the Vicinity of it.

SECTION II.

Of Inflammation of the Villous Coat of the Alimentary Canal.

Before proceeding to the immediate subject of this Section, it is necessary to premise a few general observations respecting Inflammation.

Every part of the Alimentary Canal is occasionally the seat of Inflammation, and its Consequences.

There are many authors who have conceived an unnatural and general redness and turgescence of the neighbouring arteries to be essential to inflammation. An inflamed part of the Alimentary Canal no doubt generally exhibits such an appearance; but I have also seen the bowels of patients who died

with all the symptoms of Inflammation, of a sea-green colour; which colour could not be imputed to putrefaction, as the body was examined a short time after death; and as a farther proof that the green colour was connected with inflammation, I have seen the Intestines covered in part by coagulable lymph, which united their convolutions, and in the vicinity of the coagulable lymph, blotches of a deep red colour, of different sizes.

Of Inflammation of the Villous Coat of the Gullet.

The Gullet is liable to Inflammation, not only from the general causes exciting this disease, in every sensible part of the body, but also as from its function it is exposed to a number of acrimonies, and this inflammation is very apt to extend to the Stomach.

The Villous Coat generally assumes a red colour, has a pulpy appearance, and is more sensible than usual;—an observation which may be extended to the inflammation of the Villous Coat of the Stomach and Intestines.

In consequence of the bite of a MAD DOG, I have seen, in three cases, the internal membrane of the Pharynx thrown into a state of high inflammation. The colour of this inflammation is very peculiar; it is not the brilliant red, such as that produced by vermilion, but the purple red, such as carmine or

lake gives. This inflammation, in some cases, extends down to the Gullet and Stomach *.

The inner membrane of the Pharynx is also thrown into folds, so that the inner surface of the Pharynx bears a resemblance to the inner surface of the Intestine, which is probably produced by the

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* The following authors have also remarked the inflammation of the Pharynx, Gullet, and Stomach, viz. Dr Baillie *, Morgagni †, Drs Babington ‡, Ferriar §, Tavry ‖, Marcet ¶, Powel **, Mr Borret ††, Dr Pinckard ‡‡, Mr Astley Cooper §§, in a rabid dog, and Dr Beddoes.

Sometimes the inflammation has been stated by Drs Beddoes and Rush, to affect the Larynx and Trachea; and the muscles of deglutition and speech have been observed by the latter ‖‖, to be suffused by blood.

But in none of the authors quoted, is there mention made of the spasmodic contraction of the Constrictors of the Pharynx. The only person who has also observed this, is Dr Marshal, late teacher of anatomy in London, who shewed me a preparation illustrative of this very remarkable appearance.

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* Morbid Anatomy.
† Vid. Letter VIII. Art. 25.
‡ Med. Communic. Vol. I.
§ Med. Facts and Obs. Vol. I.
‖ Vid. Mem. de l'Acad. des Sciences.
¶ London Medico Chir. Transact. Vol. I.
** London Med. and Phys. Journal, Vol. XX. p. 209.
†† London Med. and Phys. Journal, Vol. XXI. p. 271.
‡‡ London Med. and Phys. Journal, Vol. XXI. p. 59.
§§ Vid. Med. Records and Researches, p. 136.
‖‖ Vid. London Med. and Phys. Journal, Vol. XX. p. 360.

spasmodic contraction of the muscular fibres of the Pharynx; and from this cause also the amygdalæ are much compressed and forced outwards. But in some cases no inflammation has been observed.

Sauvage has informed us, in his Dissertation sur la Rage, that the bodies of those who have died from hydrophobia do not putrify so soon as usual.

Of Inflammation of the Villous Coat of the Stomach.

Though the Stomach be immediately exposed to the acrimony of our food, yet experience has shewn that the Intestines are more liable to inflammation.

Sometimes the inflammation extends over the whole of the organ; at other times it is limited to the neighbourhood of the orifices, the most frequent seats of diseases of the Stomach.

Sometimes all the coats are inflamed, but at other times only the Villous Coat; and I have seen the inflammation limited to that coat, even when that inflammation had run so high as to occasion the exudation of a layer of coagulable lymph, of considerable thickness.

The Villous Coat of the Stomach, like other mucous membranes, acquires a preternatural thickness, has a spongy appearance, with a number of small spots, of a red colour, upon its surface, some of which are in groups.

The inflammation of the Stomach is more rarely communicated to the Muscular, or Peritoneal coats, than in the case of the Intestines, and therefore is not discovered till the Stomach is opened.

But the Peritoneal coat of the Stomach is not entirely exempted from Inflammation; sometimes there are a few red spots upon the outer surface of the Stomach, in which small branches of the arteries, filled with red florid blood, may be seen.

Inflammation of the Villous Coat of the Intestinal Canal.

Inflammation sometimes extends to every part of the Villous Coat of the Intestines, but generally it is limited to a small portion of this coat.

The Inflammation sometimes affects all the coats of the Intestines, at other times it is limited to the Peritoneal or Muscular coats only; and it is more common in the Peritoneal Coat of the Intestines, than in that of the Stomach.

The Villous Coat assumes a red and pulpy appearance, from the vessels of the villi being full of blood; and there are a few spots of a deep red colour on it, owing to extravasated blood, which appearance is very strongly marked in dysentery, especially in the Colon and Rectum.

In the body of a woman who died of the Diabetes, I observed an appearance in the Intestines, similar to that occasioned by inflammation. Upon

a more accurate examination, the red colour was found owing to a red jelly effused between the Peritoneal and Muscular coats of the Intestines.

State of the Mucus.

When the Villous Coat of the Gullet, Stomach, or Intestines is inflamed, the mucus, instead of being a mild, transparent, viscid fluid, is rendered opake, white, sometimes ropy, and even frothy.

The colour and consistence of the mucus are very different in different instances, as we see more especially in the Dysentery, and depend probably upon the degree of Inflammation. The Lacteal vessels, in such cases, are sometimes filled with bloody lymph.

In some cases, the mucus seems to acquire an unusual acrimony, even though secreted in larger quantity; and which becoming greater, the longer it is retained in the body, and in passing along the Villous Coat, creates or increases the inflammation, particularly in the sigmoid flexure of the Colon and Rectum, and seems even, in some cases, to be a cause of Gangrene; and this vitiated mucus aggravates the sense of heat and soreness occasioned by this kind of inflammation.

This species of inflammation may frequently be resolved; the symptoms gradually subside, the discharge becomes less, and then somewhat resembles purulent matter; and at last it becomes more trans-

parent, and more tenacious, resembling the natural mucus.

There is a peculiarity in this Inflammation of Villous Membranes, it is apt to become chronic; or, perhaps, I should rather say, that an acute inflammation leaves this membrane in a very sensible state; so that a very slight cause is apt to renew the inflammation. Thus those who have had the Dysentery, frequently have occasional discharges of a vitiated mucus, upon slight exposure to cold.

Dr C. Smyth has very faithfully described this peculiarity in Mucous Membranes. He has observed, that "the inflammation of mucous membranes often continues, without much increase or decrease, for a long time; so long indeed, that the disease becomes a chronic, more properly than an acute one; and, in many cases, even when the principal inflammatory symptoms have been removed, a sponginess, redness, and increased sensibility of the membrane remain, with the discharge of a thin discoloured mucus; and in every instance where any of those membranes have been violently inflamed, the part continues long weak, and liable to be again affected from the slightest cause."

SECTION III.

Thickening of the Villous Coat.

The Villous Coat, from repeated Inflammation, remains in a thickened, spongy, and irritable state.

The degree of thickening is very various in the Villous coat of the different hollow bowels. I have seen it, in a greater degree, in the Bladder of Urine, than in any part of the Alimentary Canal.

The effusion of coagulable lymph is one of the most common effects of inflammation of the Villous Coat, where the inflammation has run high, and it adds considerably to the thickness of this membrane.

When the Villous Coat is the seat of inflammation, the diameter of the part which is inflamed is sometimes much diminished by the effusion of coagulable lymph upon its villous coat.

The quantity of coagulable lymph effused is very various; sometimes it is as thin as a wafer, on other occasions, in such quantities as to fill the greater part of the affected bowel.

In some cases, it forms only a thin lining to the Villous Coat, or appears in the form of tattered shreds; in other cases, it fills up the spaces between

the Valvulæ Conniventes; in others, covers these, and sometimes it takes on the form of small TUBERCLES, of a conical figure, which have been minutely described by my uncle, Dr DONALD MONRO, by Sir JOHN PRINGLE, and Sir GEORGE BAKER, as having been often found in the bodies of persons who have died from Dysentery.

I have also seen a number of small cylindrical bodies projecting from the Villous Coat of the Intestines, and which seemed to be chiefly composed of masses of coagulable lymph.

A very large quantity of coagulable lymph has in some, as in the following case, which I attended, been discharged by stool.

The patient, a Lady between thirty and forty, suffered much from pain under the ribs of the right side, which was increased by pressure, and, from headaches, attended by great dejection of spirits, drowsiness, and very obstinate costiveness.

The complaint in her bowels, and the diseased secretion from the surface of some part of the Intestinal Canal, seemed to originate from a strong purgative medicine which was given to allay a febrile attack with which she was seized after lying in; it succeeded in removing the fever, but with it her milk also, of which she formerly had a great quantity.

Her bowels were then attacked, and for three or four years, at the interval of two or three weeks

(sometimes more frequently), she passed by stool, after considerable griping, pain, and straining, attended by a sense of weight and pressure in the Rectum, a kind of whitish very viscid jelly, mixed with shreds of coagulable lymph, and in such quantity as nearly to fill the half of a common-sized chamber-pot.

After the evacuation, which only could be produced by the aid of considerable doses of castor oil, she felt much relieved.

In the course of eight or ten days, she was generally again seized by pain in her bowels, which was succeeded by very violent headache, often by nausea and vomiting.

In consequence of these very severe attacks, she has suffered greatly in her health, having frequent cold fits, similar to the attacks of an ague, terminating in a hot fit and perspiration, but without much alteration in the pulse, or other febrile symptoms.

Her body is always costive. There is nothing peculiar in the feculent matter, excepting the jelly above mentioned.

Since writing the above case, I have seen in the Collection of Mr A. Burns, of Glasgow, a specimen taken from a Child, where the same kind of gelatinous substance, mixed with coagulable lymph, adhered very intimately to the Villous Coat of the Sigmoid Flexure of the Colon and the Rectum; and above the Sigmoid Flexure, the Intestine had

given way, and the ruptured part is also covered by the same kind of jelly.

In this case, the Rectum was considerably constricted for the space of four inches.

In some instances, the portion of coagulable lymph fills up the Intestine, of which it takes an exact impression, and in this state is discharged by stool; and in the Museum of Edinburgh there are several such examples, which were sent as specimens of Worms, of a very unusual kind and size.

But in other instances, the coagulable lymph which fills up the intestines is not discharged*; it continues to plug up the Intestinal Canal, and proves the cause of death, as in the following case, for which I am indebted to Dr Walter Graham, of Dalkeith.

"*Dalkeith, May* 24, 1808.

"In the beginning of January last, I was requested to visit James Young, eleven years of age, on account of a swelling of his belly.

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* Vid. Plate XIV. Fig. 2., which was taken from a patient who died from a Crural Hernia.

In this case, so much coagulable lymph was effused, that only a small probe could be passed through the protruded portion of Intestine.

" Upon examination, the abdomen was found tense, considerably swelled, and an evident fluctuation was to be felt. He complained of a fixed pain in the left side, aggravated by the slightest motion, as in stooping, or making a full inspiration, &c. was troubled also with occasional headache; pulse, for the most part, quick, but weak, belly bound, tongue dry, and he complained much of thirst; urine very scanty. He ascribed these symptoms to a fall upon his left side, from the height of about six feet, which happened seven or eight weeks before; after which he always complained of a pain in that side, and the abdomen was observed gradually to increase in size. He was ordered Digitalis with Calomel; after a continuance of which, for about the space of a month, the fluctuation disappeared, and the swelling gradually diminished, but, with the pain, still continued in a degree. A peculiar hardness was now to be felt all over the abdomen; his appetite failed, which before had been keen, and he was much troubled with nausea and vomiting. In this state he passed ten or eleven weeks, at the end of which he was much emaciated. The Umbilicus, and about an inch of the integuments around it, became painful, slightly elevated and inflamed. A solution of the Acetite of Lead was applied, but the inflammation still continued to increase for about six weeks, when the pain became so severe, that I deemed it expedient to apply a poultice. In ten days the tumour

burst externally, and from the opening a large quantity of a yellow, thickish, and fœtid fluid escaped; and from it the fæces, or rather the unchanged alimentary mass, continued to be discharged during life.

" From the first appearance of the inflammation, his stomach was observed to swell very much; and his belly was so bound, that a stool could never be procured but by the administration of very large doses of calomel, or some other purgative; and for several days immediately preceding the bursting of the tumour, the constipation continued so obstinate, as to resist the action of repeated *Enemata Purgantia*, and very large doses of calomel by the mouth.

" The emaciation and debility increased to an extreme degree, until his death, which happened on the 7th instant.

" Having obtained permission to open the body, the following were the appearances on dissection:

" Upon cutting into the abdomen, a large quantity of a disagreeable fœtid gas escaped, and a quantity of a yellow fœtid fluid was found floating among the viscera. The omentum was very much thickened, inflamed, and ulcerated. The liver and spleen were greatly diminished in size, the former not exceeding that of a natural kidney, and as hard as a piece of turnip. The gall-bladder was very much thickened, and contained little or no bile; the Pancreas was very much diseased; the Stomach was also

much inflamed, thickened, and ulcerated. About an inch below the Pylorus there was a small hole, out of which the fæces, or rather, as before stated, the indigested aliment passed; as after eating or drinking, upon motion or coughing, it was discharged by the Umbilicus, very little changed. *The remainder of the Intestinal Canal, not an inch of which could be traced below the opening, was converted into a hard fatty substance,* which, along with the other parts, was much diseased, and adhering firmly to the Omentum and Peritoneum. The mesenteric glands were very much enlarged and hardened; the kidnies seemed of the natural size, but were of a very dark colour, and extremely hard consistence. The bladder had ascended to the left hypochondriac region, of which it occupied a very considerable part, being much distended with urine, and its coats pretty much thickened.

"Yours ever,

"W. Graham."

SECTION IV.

Of Ulceration and Erosion of the Villous Coat.

When the Inflammation of the Villous Coat does not terminate favourably, the discharge from the inflamed membrane sometimes ulcerates the mem-

brane itself, and occasions the phlegmonic inflammation, and abscess in the cellular membrane, or neighbouring parts.

The Villous Coat of the Pharynx and of the Gullet, has sometimes been ulcerated from the Cynanche Pharyngea of Dr CULLEN, from organic Strictures, and from other diseases.

The ulceration is more common in the large than in the smaller Intestines, and generally limited to a small portion of these; though there are instances where it was found to occupy a considerable portion of them.

From the continuance of the ulceration, the Valvulæ Conniventes are sometimes destroyed.

In some cases, there is so little thickening of parts, that the Villous Coat seems as if it had been cut off by a knife; but in other instances there is considerable thickening, and the edges of the ulcer assume a ragged surface.

From a continuance of the ulceration, the other coats are implicated in the disease, and are at length destroyed.

As the adhesive generally precedes the ulcerative process, in cases of erosion, preternatural communications are established between neighbouring parts, as between the Gullet and Windpipe; between the Stomach and Parietes of the Abdomen; between the Stomach, Diaphragm, and cavity of the Chest; between the Stomach and Colon; between the different

convolutions of the Intestines; between the Bladder of Urine and Rectum of the male; or between the Bladder of Urine, Uterus or Vagina, and Rectum of the female.

This unnatural communication sometimes proves the means of prolonging life, as where the matter of an abscess in the Stomach is discharged through an opening in the Parietes of the Abdomen*; as in the case related by Dr GRAHAM, where there was an unnatural aperture at the navel; or, as in the case of the unnatural anus at the Groin, in cases of strangulated Hernia; or when the contents of an abscess of the Liver are discharged into the Stomach.

Life may also be protracted by the contents of the stomach passing directly into the colon, when the pylorus has been obstructed.

At other times, the unnatural communication proves the cause of instant death, as when purulent matter passes from the Gullet into the Windpipe, or

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* Winkerus has described the case of a girl who, about the period of puberty, had an abscess in the left Hypochondriac Region, which discharged a great deal of matter.

The ulcer seemed to heal; but it opened again, and discharged a good deal of pus, the contents of the Stomach, and some fragments of carious ribs. She lived in this deplorable state till she was forty-two years of age, and died at length of Atrophy.

Upon dissection, a communication was discovered between the stomach and the parietes of the abdomen, and the Pylorus and Intestines were much contracted.

when the contents of the Stomach are discharged into the chest or lungs.

SECTION V.

Of Gangrene.

Inflammation of the Villous Coat rarely terminates in Gangrene; but there are instances of this description, which are owing rather to the cause than to the species of the Inflammation.

When part of the Alimentary Canal has been reduced to a state of Gangrene, it assumes a black colour, emits a fœtid odour, tears like a piece of wetted paper, and the veins of the part do not fill again after the blood has been pressed out, coagulation having taken place. The Intestines sometimes assume a leaden colour, even though mortification has not taken place, so that the leaden colour is by no means an infallible index of Gangrene; for the Intestines, when of such a colour, sometimes retain their usual texture, the colour being produced by the distention of the smaller veins of the Peritoneal Coat, and of those which are distributed through the Cellular substance; in proof of which, such portions of Intestine, even when preserved for many years in spirits, retain their natural firmness and tenacity.

In some cases of Dysentery and Fever, attended

by colliquative Diarrhœa, the Villous Coat of the Intestines appears of a deep purple or black colour, which, at first sight, very much resembles mortification, in the way above mentioned; but is produced by the veins of the Villous Coat being gorged with blood, and also by blood effused into the Cellular Coat, shining through the semitransparent Villous Coat.

Symptoms.

The inflammation of the Gullet is characterized by pain, and sense of stoppage in the throat*, which is much increased by swallowing; and by the swelling of the part, quick pulse, and general fever. The patient, at the same time, has a very copious discharge of ropy mucus and Saliva, and some think they have a Ball in the Throat.

Inflammation of the Stomach is generally preceded by a cold fit, fulness and tenderness of the abdomen, followed by a fixed acute burning pain in the region of the part affected, which is much increased by pressure, inspirations, and coughing, and by taking the mildest food, and attended with a frequent hard, and contracted pulse. Pressure on the Stomach often aggravates the pain so much as to be intolerable, and sometimes produces retching or vomiting, and the immediate rejection of every

* Vid. Eller de Cognos. et Curand. Morbis.

kind of food the patient swallows; this is followed by great oppression in the breathing.

The symptoms of inflammation of the Villous coat of the Intestines, are somewhat different from those of the Peritoneal coat.

There is constant but not extremely acute pain extending over the belly and loins, which is accompanied by a frequent, hard, but contracted pulse, thirst, dry skin, and other febrile symptoms, and anxiety of countenance.

This inflammation may be distinguished from that of the Peritoneal Coat, from the symptoms being much less acute.

The pain in the region of the belly is generally by no means so acute, and is not much increased on slight pressure. There is not the same degree of tension of the belly; the Abdominal Muscles are not contracted so as to give the appearance of distinct tumours, nor does the patient bend forwards to relieve the Spasmodic Contraction, into which the Abdominal Muscles are frequently thrown.

In some instances, these symptoms are succeeded by nausea, and vomiting of bilious fluid, and sometimes even of fæces. When the inflammation extends to the Muscular Coat, there is sudden aggravation of the pain, from the Muscular fibres being thrown into violent Contraction.

There is sometimes a degree of purging of a gelatinous matter, tinged by bile; and which purging continues until the disease be removed.

But, in other instances, little or nothing is discharged. When the patient strains, in order to endeavour to procure a passage, only a mucous matter is discharged; the quantity of which, in some cases, is considerable. A Clyster thrown up, is returned unaltered; what is passed having neither the smell, colour, nor consistence of feculent matter. On a sudden the patient is much relieved; the pulse becomes much smaller and softer, the pain of the belly goes off, the face grows pale, and the eyelids are sunk, and, in a short time, delirium and death follow.

It has been thought a favourable Symptom, when the medicines given remove the costiveness, and when the pulse becomes lower and fuller; but sometimes, notwithstanding these favourable symptoms, a fresh attack of inflammation comes on, and the patient dies soon thereafter unexpectedly.

In the more favourable cases, upon a purgative being given, small shreds of coagulable lymph are discharged with the stools; and this is a proof of the abatement of the inflammation.

According to Van Swieten and Hoffman, it is possible to judge of the inflammation, from the seat of the pain, or from the food being sooner or later discharged by vomiting. Thus Van Swieten observes, that the food, in cases of local inflammation, brought on by Ileus, is sooner or later rejected by vomiting, in proportion as the inflammation is nearer, or a greater distance from the Stomach, and

if the pain is at or near the navel, the disease is then referred to the small intestines. But little stress can be laid upon such a diagnosis; as, from the remarkable degree of Sympathy betwixt the Stomach, and different parts of the Intestinal Canal, and from the pain extending from one part to another, the patient seldom refers the pain to its proper seat; besides vomiting sometimes occurs when the patient has eaten nothing, as in cases of Strangulated Hernia; and, farther, such distinctions, therefore, scarcely merit attention, as neither regulating nor altering the practice.

The inflammation of the Colon frequently gives rise to pain in the side and breast, like the Pleuritis, and also to Symptoms resembling those of the inflammation of the Liver.

On the other hand, symptoms very similar to those of Inflammation of the Intestines, are sometimes occasioned by diseases of neighbouring Viscera.

It is necessary also to add, that there are many deviations from the train of symptoms already described.

The earlier symptoms of the disease are not well marked, which leads the patient to attribute them to costiveness.

Sometimes the inflammation of the Intestines begins, like that disease of the Kidney, by an acute pain in the Loins, to which severe pain in the belly

succeeds. Besides, I have observed a common bilious Cholic preceded by distinct chills.

Morgagni has very ably described* the chronic inflammation of the Intestines; it is not attended by constipation, vomiting, fever, quick pulse, sense of heat, and acute pain, but rather by a sense of tearing or gnawing; and he even says it may exist without pain; and he strenuously recommends the most strict attention to the case, as the chronic inflammation very frequently becomes acute, and rapidly terminates in gangrene.

Of the Symptoms of Hydrophobia.

This dreadful disease has generally been supposed to be communicated only by the Saliva of an animal that has the hydrophobia, being applied to a part from which the scarf-skin has been removed. The disease does not shew itself for some time after the poison has been received. In the human body it lies dormant for many months; and according to Galen, and Dr Mead, and Callisen †, sometimes for an year or more.

There has prevailed an opinion, that the nearer the head the poison is received, the more rapidly the disease comes on. But I much doubt the ac-

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* Vid. Letter XXXV.

† Post annos. Vid. Syst. Chir. Hod. Vol. I. p. 593.

curacy of such a remark; for my Father attended a Lady, who was bitten upon the side of the Nose by a favourite dog, and eight months elapsed before the symptoms of hydrophobia appeared.

The symptoms of hydrophobia come on much more rapidly in animals that have been bitten, very often in three or four weeks.

The appearance of the part bitten is very peculiar; the scar is very itchy; it assumes a red colour, inflames, swells, and bursts, and an ichorous fluid is discharged. The part bitten assumes a ragged surface; its edges are inverted, and is somewhat of a pale blue colour; it is again, perhaps, covered with a scab, which the patient tears off, the part being extremely itchy.

The peculiar symptom from which the name of this disease is derived, namely, the dread of water, is usually preceded by extreme irritablity and irregularity of temper, lassitude, general uneasiness, headach, attended by giddiness, drowsiness, disturbed sleep, sense of faintness, depression of spirits, oppression at the præcordia, and aversion to light and society.

There is a painful sensation in the part bitten, which extends to the neighbouring parts, to the trunk of the body, and even to the fauces. Though it be probable that the poison is absorbed, yet the Lymphatic Vessels and Lymphatic Glands have not been observed to be indurated or swelled.

Some patients suffer acute bodily pain, which somewhat resembles acute Rheumatism; some-

times the pain is limited to the Neck, which is rendered very stiff. A sense of constriction is felt in the throat and breast, and the breathing and deglutition are difficult; in some patients convulsive inspiration may be observed, as upon going into the cold-bath; in others, there is a severe struggle for breath, which is interrupted by deep sighing and sobbing. The patient has great dread for water, or any other fluid, even though he suffers much from thirst, and heat of his gullet and stomach. Upon attempting to swallow, the greater part of the fluid is rejected through the nose, and the greatest anxiety, spasms, a sense of strangulation, and a loss of sense follow.

Though fluids are rejected, solids pass down in some cases.

The thirst and internal heat increase with the desire to drink; and the patient, incapable of swallowing his saliva, spits it out, and suffers much from a dryness of the mouth and throat.

So great is the horror for water, that even the sight of a fluid, or of a looking-glass, or the noise of water poured from a tea-pot, throws some patients into strong convulsions.

I visited a patient to whom this happened, notwithstanding which, she had so much resolution as frequently to attempt to drink, and often succeeded, but in a few minutes afterwards the aversion to liquids returned as strong as ever; and she at last died while endeavouring to swallow.

At this period, the wildness and redness of the eye, frothy saliva in the mouth, melancholy, anxious and timid expression of the countenance, strongly mark the disease.

By this disease the body is reduced to a very irritable state; the least noise is offensive; the opening or shutting a door affrights; a bright light, or even sometimes the sight of any thing white, gives uneasiness.

Fever comes on, with quick but low pulse, and this is followed by delirium; and the patient, bereft of reason, attempts to bite every thing in his way, and sometimes even his dearest friends.

At intervals, some patients are sensible, are melancholy, and resigned to their fate, and warn the bystanders of their danger.

The agitation and delirium increase, with the convulsive twitchings of the muscles, and the difficulty in breathing; the pulse throbs violently, cold sweats follow, and the patient expires, after having been much convulsed, and generally in the course of six or eight days from the appearance of the more urgent symptoms.

To illustrate more fully the symptoms of Hydrophobia, I have subjoined the history of a Case of that dreadful disorder, which I attended along with Dr Rutherford, and which has been drawn up by him with his usual accuracy and perspicuity.

"NELLY STUART, æt. 74.—On the 3d of July, had the back of her right hand considerably torn by a dog, at which she imprudently aimed a blow, as he was running on the highway, apparently furious, and pursued by the country people as mad. She was at first a good deal alarmed by the accident, and within a few hours had the wound carefully washed with a solution of soap in water, and afterwards covered with lint. The sore was dressed regularly, and it healed as soon as could have been expected from its lacerated nature, without being attended by any considerable pain, except at the knuckle of the fore-finger. After the sore had cicatrized, some swelling of the surrounding teguments still remaining, she was advised to pour salt-water on the hand, which she did for some weeks, with the effect of removing every degree of fulness. During the whole of this period she used no internal medicines; and after recovering from the tremor into which she was thrown at first, she seems to have entertained no apprehension of any dangerous consequences from the bite.

"She continued free from any complaint, except occasionally a slight pain in the above-mentioned knuckle, till Thursday evening, the 13th of September, when she was affected with a severe pain, stretching from the knuckle to the cicatrice of the sore, and from that along the ulna and outer part of the humerus to the shoulder. Much about the same time, she

was seized with a cold shivering, followed by heat, thirst, sickness at stomach, and other febrile symptoms. These, during the night, were relieved by a profuse sweat, which continued during the greater part of the Friday following; but towards the evening, she perceived an unusual difficulty both of articulating and of swallowing, although she felt no pain or uneasiness about her throat. It would appear that she passed a very restless night between the 14th and 15th, being tormented with an excessive thirst, but incapable of swallowing, without experiencing violent convulsions.

"On the Saturday morning, these symptoms continued, and she complained much of the pain stretching along her arm, and at her shoulder. She was brought into the hospital about seven o'olock in the evening, and had immediately a draught with fifty drops of laudanum. She appeared much agitated and fluttered by the smallest noise. Her looks had a strange mixture of wildness and timidity. She was perfectly sensible, but found great difficulty on attempting to speak, though after some efforts she was able to articulate distinctly, and her words were then uttered with extreme rapidity. On proposing to her to swallow any liquid, she appeared much frightened; and though, on repeated requests, she consented, yet the sight of the fluid never failed to excite strong symptoms of abhorrence, and convulsions of her face and throat. After waiting some time, till she could call up sufficient resolution, she

carried the cup hastily to her mouth, turning away her eyes, and then gulped down the contents with inconceivable rapidity, amidst violent convulsions of the muscles of her face, throat, and upper part of her body. For some time afterwards, she continued much agitated and convulsed, with efforts to retch, much sobbing, and frequent anxious respiration. She talked in the intervals with great unconcern of the wound of her hand, but complained much of the pain of her shoulder; at the same time insinuating, that it was only a rheumatic pain, to which, it seems, she had been formerly subject. Pulse 102, somewhat sharp, but not strong; skin very warm, but moist; tongue white and clammy, and she still complained of thirst, but had no headach, or uneasiness about her throat.

" About eleven on Sunday, her looks were extremely wild, at the same time expressive of great horror. When spoken to, she was immediately affected with convulsive motions about the throat, which precluded any utterance. By degrees she recovered the use of speech; said she had no pain, but extreme thirst; her tongue was white and clammy; pulse, at first above 100, presently, however, it sunk to somewhat above 80. When drink was offered her, the convulsions in the throat were immediately induced; her looks and gestures were still more expressive of distress; however, she was persuaded to try to take a little gruel out of a spoon. This, after various efforts, she

snatched at suddenly, and gulped down, with seemingly great pain and distress, and violent agitation of all the muscles of her face and throat. Such paroxysms were frequently renewed by the mention of any liquid, or any question or object which caused any sort of surprise. But all the while she was completely sensible, and in the intervals of the fits gave a distinct account of her previous situation, and seemed much affected with the distress of a patient that lay opposite to her; expressed also her gratitude for the kindness that was shewn to her, and her resolution to attempt whatever might be judged proper for her recovery.

"The external fauces were well rubbed and covered with lint, soaked with the following spirit, sp. vini. camph. ʒss. æther, laudan. a ʒij.; and the following draught ordered, camph. ℈i, æth. ʒi. laudan. gtt. l. aq. hord. q. s. One half of this was got over with great difficulty. Her pulse became much slower and weaker. Some time after she got the remainder. Three *p. m.* she was nearly in the same state as before. She was persuaded to swallow some morsels of bread, soaked in milk. In the course of the afternoon, she was moved into a more convenient apartment, as she seemed manifestly more agitated by the appearance of many persons around her. She also got another draught. Eight *p. m.*, when I saw her, she appeared to be extremely distressed and disturbed. Answered, after the convulsions were subsided, with haste, and seemed rather con-

founded; presently, however, was soothed, and spoke quite rationally; lamented her own situation. When asked if she was in pain, replied, no; what particular uneasiness she had—Do you not see? seemingly referring to a certain strangulation and interruption of breathing betwixt a hickup and cough. Her pulse was feeble and quick. Her skin cool; tongue as before. After a short while, she expressed great gratitude for the attention that was paid her; prayed fervently that she might be enabled to endure, with patience and resignation, the trial to which she was subjected, till it should please the ALMIGHTY to release her from her sufferings; and that no unguarded expression might escape her, that could convey want of the most perfect submission to His will.

"She said that she thought she could now try to swallow; a spoonful of milk was given, which she swallowed with the usual convulsions. Soon after she remarked, that it was not that but her medicines which she required. A spoonful of her usual draught was given, but the convulsions were now much more violent; her breathing was more interrupted, long intervals being observed betwixt each successive inspiration, and her pulse sinking so low as hardly to be felt. By degrees she recovered; and being raised again, she herself proposed to take another spoonful; this was accompanied with less commotion than before; but she then requested to be allowed some rest

after the severe struggles she had undergone. At this time it was very apparent, that the glare of a candle, or any bright object, immediately caused the convulsions. I asked if she thought she could take a bit of bread soaked in wine; to which she answered, that it would not be amiss. Some little bits she afterwards got over, and the remainder of the draught. Eleven *p. m.* all the symptoms were more violent; still, however, she was distinct; seemed very uneasy at first at my approach, as she dreaded another dose; was immediately startled, and convulsed when a candle was brought before her; said she could not bear the sight of it; when offered a bit of bread with wine, entreated it might not be insisted upon, as she was sure it would not, did we know the painful struggles it occasioned to her. Her pulse was not to be felt; breathing more cut or interrupted; tongue white, and much viscid saliva appeared to have collected about the fauces; a cough, or some motion betwixt that and hickup, much more frequent, and at times caused such a noise as might, by a lively imagination, be compared to the barking of a dog. An emollient injection was ordered; and after the operation of it, an anodyne and fœtid one. The former was administered, but immediately returned, without any fœculent matter. She had had no stool since admission, though she had passed a small quantity of urine. The anodyne injection she could by no entreaty be made to receive. During the night she had no sleep, but tossed about per-

petually in great agony, frequently delirious, and affected with convulsions, extreme anxiety, and sense of instant dissolution. At nine *a. m.* all the symptoms seemed aggravated; she had often short paroxysms of universal convulsions and tremor. The pulse was not to be felt at the left, and hardly at the right wrist; about 120: she often tossed about; started up in bed, and threw herself down again; the catching at her breathing incessant; often recovering, however, she presently recollected herself; said she had no pain, and, notwithstanding her seeming agony, could specify no particular distress. She asked for a mouthful of cold water, which she got over in part, with violent struggles, and immediately cried out she was gone. She was, however, prevailed on to swallow a bolus of op. gr. ij., camph. gr. xv. This occasioned a similar paroxysm to that which had been induced by the water.

"Some time after, when she had become more quiet, she was put into a warm bath. This caused no particular distress, and she remained free from convulsions while in it. Unfortunately she seemed to sink so fast, and grew so faint, that the time could not be protracted beyond fifteen minutes. She was replaced in bed, and presently became more agitated than before the bath; but as soon afterwards too many visitors had got into the apartment, she became much more delirious, restless, and convulsed. About one *p. m.* a second bolus was ordered, and, though with much horror and reluctance, she

got it swallowed, and after it a spoonful of wine, and apparently with more ease than the former. Nor were the convulsions succeeding either so violent, or so long continued. In less than half an hour, however, they returned; her delirium increased to frenzy; she struck at her attendants, so that it was necessary to confine her arms by means of a jacket. It was said that she then attempted to wound her attendants by biting; however, in a few minutes after, the convulsions becoming more general and severe, she expired a few minutes before two.

"The body was taken away from the hospital by her friends, but was opened on Wednesday, just forty-eight hours after death.

"Though so considerable a time had elapsed between her dissolution and the examination of the body, not the smallest symptom of putrefaction had made its appearance.

"The Fauces, Larynx, and Pharynx were found in a state perfectly natural; there was not the least vestige of suppuration, inflammation, or even abrasion; no unusual collection of saliva. The Oesophagus was examined during its whole course, without any morbid appearance being discovered. The Stomach was contracted to a very small size; and upon opening it, the smell of the camphor she had swallowed before death, was distinctly perceived. The Cardia was slightly tinged red, from the small quantity of conserve of roses she had taken, but on wiping it

clean, it appeared, as well as the rest of the Stomach, perfectly sound. The whole Abdominal viscera were in a natural state; the large Intestines alone being distended with flatus.

"The Thoracic viscera also were in a state unusually sound. No adhesions between the lungs and pleura costalis. No morbid appearance whatever in the lungs themselves. The heart not more distended with blood than usual, and that blood in a coagulated state.

"The head was not examined."

Of the Symptoms of Thickening of the Villous Coat.

The Villous Coat of the Gullet sometimes attains so unnatural a degree of thickness, as to impede deglutition; and it then is necessary to throw up nutritious clysters to prolong the life of the patient.

It is of moment to distinguish this from the other organic diseases which obstruct the Gullet, and especially from that which originates from an enlargement of the glands in the vicinity of this organ.

"On distinguera (says RICHERAND) le retrécissement dépendant de l'épaississement des parois de l'œsophage, de celui qui résulte de la compression qu'exercent les glandes voisines, à la facilité qu'on éprouve, dans ce dernier cas, à faire pénétrer la sonde. La maladie est cependant alors bien plus fâcheuse, car elle est ordinairement incurable;

tandis que, par l'usage prolongé des sondes, on peut dilater l'œsophage comme l'urèthre, et dissiper l'engorgement de ses parois *."

But I doubt much the accuracy of the above observation, and more especially after having received a drawing, from Mr Astley Cooper, from a preparation which is preserved in the Museum at Guy's Hospital, in which the Oesophagus, by a circle of indurated and enlarged Glands, is so much compressed and diverted from its usual course, and, at the same time so much contracted, as only to be capable of receiving a common writing pen; besides, it is prodigiously enlarged above the seat of the obstruction.

It may not be improper to suggest the necessity of great caution in passing a bougie, when the sides of the Gullet have been contracted, as the instrument may otherwise be forced through the Gullet, which may prove fatal.

The Bougie may also be forced into the Windpipe: it should not be introduced quickly, when the tongue is pushed out, for thus the Epiglottis is raised, and the Bougie may pass into the Windpipe; the patient should be directed to imitate the action of swallowing, to draw back the tongue, by which the Epiglottis is pushed down; the instrument is then to be pressed against the back of the Pharynx,

* Vid. Nosog. Chir. Tom. III. p. 314.

by which, as it is flexible, it will be directed into the gullet.

The thickening of the Villous Coat of the Intestines is generally partial; and it is most frequent in the Rectum, and often proceeds from the operation of Fistula ani, the extraction of Piles, Varicose Veins, according to Dessault and Richerand, from Lues Venerea, and from diseases of the Bladder of urine. I have seen one or two cases, such as Dr Baillie* has described, in which there was *a projecting ring* formed in the cavity of the Jejunum.

The thickening of the Villous Coat of the Intestines, is characterized by the tongue being covered with mucus, loss of appetite, nausea, vomiting, thirst, flatulence, griping, frequent desire to go to stool, tumour, and by the discharge of a ropy mucus, which is tinged or streaked with blood; and when the thickening is limited to one part, and is considerable, very little solid fæculent matter is discharged.

From the repeated and violent efforts at the water-closet, the Rectum is in some cases inverted.

When the thickening is near to the anus, by drawing the edge of the thickened portion downwards, the fæces are discharged.

The cases which have been described in pages 120, &c. in which coagulable lymph had been ef-

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* Vid. Morbid Anatomy, page 193, 2d edit.

fused upon the Villous Coat of the Intestines, sufficiently explain the concomitant symptoms.

When the Villous coat of the Alimentary Canal has attained an unnatural thickness, the mucous Glands of the part affected are always larger, and their orifices are more apparent than usual, as will be afterwards more fully described, in treating of the organic diseases of the Mucous Glands.

Symptoms of Ulceration of the Villous Coat.

The symptoms which denote ulceration of the Villous Coat, are, slight hot and cold fits; hectic flushing of the face; pain in the part affected, becoming less acute, and detumefaction of the belly; pulse fuller and slower, often irregular.

When an Ulcer exists in the Gullet, it creates painful and difficult deglutition, which is accompanied by a sense of suffocation, expectoration of pus, or of a large quantity of spittle *, disposition to vomit; retching, which is attended by cough, so that every kind of food, whether it be solid or fluid, is rejected by vomiting.

Ulcers in the Gullet are very seldom cured; they are kept up, and often extend to a great degree, from the perpetual irritation of the Gullet in swallowing.

From the continuance of the disorder, the diffi-

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* Vid. London Med. Communic. Vol. I.

culty of swallowing becomes greater and more painful, and solids, and even liquids, do not pass down, unless the latter be taken in considerable quantity; the liquid passes through the ulcerated surface merely by its gravity, the muscular fibres being destroyed; and hence a small quantity of a fluid cannot be swallowed.

The patient becomes very thin, and very weak, and also very costive, hot, thirsty and feverish; and the pulse is small and very quick; and in this state languishes for a few months: at length he is affected by stupor and delirium, and dies completely exhausted.

The Ulceration sometimes extends from the Villous to the other coats of the Gullet, and to the neighbouring parts, as in a case related by Dr GARTHSHORE*; but it generally follows the op-

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* The body, in this case, was examined by Mr Hunter, whose interesting account of the dissection is subjoined.

"On laying bare the œsophagus through its whole course, I found, that where it passes below the division of the trachea, the surrounding parts were thickened or diseased; and I there found an abscess which led into the cavity of the œsophagus. I then cut out a considerable portion of the œsophagus, both below and above this diseased part, with a part of the trachea, and also a portion of the descending aorta. I could easily pass one finger downwards, and another upwards, till they met; so that there was no stricture or closing of the œsophagus, although I could plainly feel an irregularity on the inside at this part, where the disease appeared externally.

posite course, and has been sometimes ulcerated, when an abscess has formed in the Lungs.

When the Villous Coat of the Stomach or Intestines is ulcerated, the patient suffers from a sense of heat and dryness in the throat and Stomach, Heartburn, which are increased by taking food, im-

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"The œsophagus was then slit up its whole length, and its inner surface exposed; upon which we observed the following appearances:

"The œsophagus, at the part where it appeared externally, was in a state of ulceration on its inner surface, for about four inches in length, terminating at each end at once in a regular edge, which edge was a little raised, as is frequently seen in bad ulcers in other parts; and the œsophagus, immediately above and below, was perfectly sound, not being even thickened. About the centre of this ulceration was the opening of the abscess, or what may be supposed to be a continuation of the ulceration, into the surrounding parts, forming an ulcerous cavity, which was situated immediately below or between the division of the trachea.

"The surrounding parts that were in some degree connected with the disease, at least by adhesion, were, a part of the descending aorta, the posterior surface of the auricles, the basis of the lungs of the right side, the left division of the trachea, and some of the lymphatic glands of those parts.

"The stomach was very much contracted at the small end for more than half of its length; and the left or great end was a little dilated with a fluid which appeared to be principally bile.

"The small intestines contained nothing but mucus, and of this but a small quantity.

"The cæcum was a little dilated with a fluid; but the whole of the colon to the anus was contracted, probably as much as it was possible, as it had hardly any mucus in it."

paired digestion, and discharges, by vomiting or stool, purulent matter, and sometimes portions of the Villous Coat *.

The patient being much exhausted by lingering fever, dies at length from Marasmus.

Galen, in his treatise De Locis Affectis, seems to be of opinion, that it is possible, from the appearance of the fæculent matter, to discover the seat of the ulceration in the Intestines.

If blood be mixed with the excrements (he observes), the ulceration may be supposed to be in the small Intestines; but if it is on the surface, it is in the large Intestines; and especially if abrasions and fatty substances are at the same time discharged.

When the ulcer is in the Rectum, the patient has a constant degree of tenesmus, voiding at the same time very little, which chiefly consists of a pituitious matter; and he has frequent calls to make water, and several other symptoms, which are very similar to those of Stone in the Bladder of Urine.

Of the Symptoms of Mortification of the Villous Coat.

There is great reason to apprehend that Mortification has come on (to which the Intestinal Canal

* Vid. Edinb. Med. Essays, Vol. VI. p. 146; also Tulpius, 17th Obs. 3d Book.

is peculiarly liable), when the abdomen swells, and seems distended by air; when the deglutition becomes difficult, and the tongue becomes dry and black, when pain in the bowels suddenly ceases, and is not increased on pressure, and is attended by a very quick and feeble pulse, coldness of the extremities, syncope, discharge of a very offensive air by the mouth and anus, collapsed features, dark coloured and very fœtid stools, which are discharged involuntarily, by hiccough, delirium, and convulsive twitchings of the muscles.

SECTION VI.

Of Inflammation, Ulceration, and Erosion of the Villous Coat, from Dysentery.

The Villous Coat is thrown into an inflamed and ulcerated state, and also eroded frequently, in consequence of Dysentery.

The following account of the morbid appearances occasioned by Dysentery, I extracted from a manuscript which was bequeathed to me by my late uncle, Dr Donald Monro, who, during the long time he served in the army, had very ample opportunities of witnessing the effects of the Camp Dysentery.

Of the Appearances of the true Dysentery.

When the disease has proved fatal in a short time, the Stomach, and the great and small Intestines have been frequently found with a greater or less degree of Inflammation; and in old cases, when the patient has been attacked with a sharp pain in the belly before death, I have seen the Rectum, Colon, and Stomach with black gangrenous spots.

On an accurate examination, these black spots were found to be owing to black blood diffused through the Cellular Membranes, situated between the fine internal Villous and the Muscular Coats of the Intestines; and in the middle of these black spots there was generally more or less of an Erosion of the Villous Coat.

On raising the Villous Coat which covered these black spots, it appeared fine and transparent, though the Cellular membrane below was black; and on dissecting away this black cellular membrane, the muscular fibres of the Gut appeared of their natural colour.

Sometimes I have observed ulcers of a considerable size in the Villous coat of the Rectum.

In some subjects, there were some spots appeared on the outside of the Gut, which, upon examination, were found to be occasioned by extravasated Liquors in the Cellular membranes, between the Peritoneum and muscular coats of the Intestine.

From what I have mentioned of the black and livid spots which appear on the internal surface of the great intestines, and of black or bloody fluids being diffused through the Cellular membranes, and of the Villous Coat appearing transparent, and when raised from these black cellular membranes in places where it had not been eroded, I think there is no doubt but that the erosions of the Villous Coat are occasioned by Suppuration of these inflamed parts of the Cellular membranes, or by a kind of gangrene or ulcer in them; though I think, from the accounts we have in authors, of the Dissections of persons who have died of the Dysentery, it should appear that there is no part of the Alimentary Canal that has not been found inflamed, or in a state of Gangrene or Suppuration.

There may be observed, in some cases, on the inner side of the lower part of the Colon, and upper part of the Rectum, a number of little Tubercles, or excrescences, which resemble the Small-Pox Pustules at the height of the disorder, but differed from them in this, that they were of a firm consistence and without any cavity.

These tubercles are sometimes cleft on their surface, and somewhat resemble small warts. This appearance is only observed in the Camp Dysentery.

In my account of the diseases most frequent in the British Military Hospitals in Germany, I have mentioned the Case of a Woman who died of the

Dysentery, where the Intestines, and especially the Colon and Rectum, were inflamed, and the internal surface of the great Intestines mortified, and contained little vesicles, full of a putrid fœtid liquor, numbers of which she had evacuated by stool, some days before her death. An appearance somewhat similar to this, I saw in a patient who died of a violent Diarrhœa in the beginning of the year 1766, in St George's Hospital. On examining the body, there was a great number of small prominences found on the internal side of the Colon and Rectum, with erosions of the Villous Coat in the middle.

On squeezing these prominences, a number of vesicles of a Mucus or Gelatinous liquor, some of the size of millet seeds, and others larger, came through the eroded parts of the Villous Coat.

The Canal of the Intestines has been stated, by Rhodius,* to have been sometimes obliterated, in consequence of the adhesion of its opposite sides, when there has been an extensive ulceration from Dysentery.

Scirrhous Tumours have been described by Meckel, as being sometimes found within the Colon in cases of Dysentery †.

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* Vid. Rhodius, Mis. Cur. Obs. 508.

I have observed the Appendices Epiploicæ of the Colon and Rectum much enlarged in cases of Dysentery.

† Vid. Meckel, extra Comment. Leipsick, Tom. XV.

Of the Symptoms of Dysentery.

There is great variety as to the severity of the symptoms in this contagious disease, which, during infancy, is generally milder than at a more advanced period of life.

The disease commences by coldness, shivering, alternating with hot fits, uneasy and often painful sensations in every member of the body, foul tongue, bitter taste in the mouth, nausea and vomiting.

These are succeeded by symptoms denoting a derangement in the functions of the Intestines, as flatulence, diarrhœa with griping, followed by tenesmus, and the discharge of a white viscid ropy mucus, mixed with a suetty substance, or tinged or streaked with blood.

Very little fæculent matter passes off, and it comes away as hardened balls or scybala, and with a painful descent of the bowels accompanying every evacuation; and, in some cases, the Rectum is inverted.

The Pulse is quick and full, and, in the young and plethoric, there is flushing of the face, and redness of the eyes, with acute headache and fever.

The Fever is sometimes a Synocha, but generally a well marked Typhus; and sometimes an Intermittent, which assumes the Tertian type.

In the course of this form of the disease, which is of various duration, sometimes proving fatal in a

few days, and at other times lasting for months, pure blood, portions of a cheesy-like substance, coagulable lymph, and even portions of the Villous Coat have been discharged by stool.

In the most acute form, called the Malignant Dysentery, the earlier symptoms are tremors, great heat and anxiety, very acute headach, excessive thirst, dry scaly skin, acute pain in the abdomen, which is aggravated by pressure, with small hard pulse, tongue of a bright red colour, nausea and vomiting, and great prostration of strength, which often amounts to syncope.

Notwithstanding the constant desire to go to stool, very little is passed; this is generally green, in the earlier stages of the disease, and exhales a peculiar faint odour; but, in the more advanced stages, it becomes black, is streaked or tinged with blood, or pure blood is discharged, which is remarkably fœtid, and so acrid that the anus becomes inflamed, and even excoriated; and, in some cases, considerable masses of coagulated blood have been discharged.

The discharge of this matter affords a momentary relief.

The patient daily becomes weaker and weaker; his food passes through the Alimentary Canal unchanged; the breath becomes fœtid, the tongue black and dry, or covered with aphthæ; Vibices and Petechiæ appear, and what is passed is sanious,

fœtid, and black, which is the prelude of death, the bowels being then in a state of gangrene.

There have been some Epidemic Dysenteries, as that described by MARQUET, which occurred at Nancy in 1734, in which the Inflammation of the Intestines have been still more strongly marked by the violent pain in the Stomach and Intestines, which is much aggravated even by the slightest pressure, by a burning heat, extending from the throat to the anus, by redness and dryness of the tongue, by hard and contracted pulse, by vomiting, and the very rapid progress of the disease, which proved fatal in ten or twelve hours; and the mucous glands of the Intestines are much enlarged, and filled by a cheesy substance, or ulcerated.

The Dysentery leaves the Villous Coat of the Intestines in a thickened, spongy, and very irritable state; so that, upon exposure to cold or moisture, and especially when applied to the feet, the patient discharges, by stool, a vcisid mucus, and even after many months or years have elapsed.

In the same manner, the mucous membrane of the Urethra is reduced to a very irritable state, by Gonorrhœa; redness, and sponginess of the membrane remain (as we often observe in the eye-lids); and any very slight cause is apt to renew the Inflammation, and its attendant symptoms.

A man who had Gonorrhœa in his youth, supposing himself in perfect health, marries; a day or two thereafter, he, or sometimes his wife, observes his

linen stained. Conscious of not having had for some time connection with a woman of a suspicious character, he suspects the fidelity of his wife; and she supposes that she has received the disease from her husband. Both parties are thrown into a state of great anxiety and alarm, which is very groundless; for the discharge does not possess a virulent quality, being merely the consequence of over excitement of a membrane, weakened by previous repeated inflammation.

What is remarkable, some patients are subject to such discharges at particular times; in others it appears at a very distant period.

Thus, a man who has had repeated Gonorrhœa in youth, is subject, even in old age, to an occasional discharge from the Urethra.

There is another circumstance in the history of Inflammation of mucous membranes, which well merits attention, viz. that it is often difficult to distinguish the primary from the secondary disease.

Thus, a Stone in the Bladder gives rise to the same kind of discharge as a Gonorrhœa; or a Leucorrhœa occasions the same discharge as a Gonorrhœa; or a Stone, or the Scirrho-contracted Rectum produces symptoms somewhat similar to those of Diarrhœa, Mucosa, or Dysentery.

SECTION VII.

Of the Milt-like Tumour of the Mucous Membranes.

This tumour has, as far as I know, entirely escaped the attention of Pathologists.

I have called it Milt-like Tumour, as it resembles, in colour and consistence, the milt of many fishes; and have added the words of Mucous Membranes, as it grows only from membranes of that description.

This tumour bears some analogy to the tumour described by my Grandfather, under the name of an Anomalous Tumour, and which has been lately called, by Mr Burns of Glasgow, Spongoid Inflammation, and by Hey of Leeds, the Fungus Hæmatodes.

But it differs from that dreadful malady in many of its characters, as will appear in the sequel, by instituting a comparision between these diseases.

The above disease also bears some analogy to that organic disease of the Testes, which has been described by Dr Baillie, under the head of Pulpy Testicle.

This species of Tumour generally attains so considerable bulk, as to fill and even distend to an unnatural bulk, the bowel within which it is contained, as I have seen in the case of the Bladder of

Urine; but, in other cases, this Tumour grows from a part only of the Mucous Membranes, lining the bowel*.

This disease does not prove speedily fatal; for I had occasion to attend a patient who laboured under it for two or three years.

The Milt-like Tumour, in many respects, resembles the milt of fishes; it is of a pale red colour; and it also is nearly of the same consistence, but rather softer, and has an irregular surface, and is covered by a thin membrane, upon which there are a number of vessels filled by red blood.

This species of Tumour very readily falls to pieces, and mixes in part with water, forming a turbid mixture; and it is somewhat hardened by being put into strong spirits. It adheres but slightly to the organ from which it grows, by a number of small processes, which insinuate themselves into the Villous Coat, which has attained an unnatural thickness; and when the Tumour has been detached, the Villous Coat of the diseased bowel assumes somewhat of a Honey-comb appearance, and it is besmeared by several drops of blood, which are derived from the vessels, which extended to the Tumour, being torn.

The bowel from which such a Tumour grows externally, betrays marks of inflammation; there is

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* Vid. Plate V.

evidently an unnatural determination of blood to the Seat of the disease, the blood-vessels upon the Peritoneal coat, being not only larger, but also more numerous than in the healthy state.

The neighbouring Lymphatic Glands also partake of the disease, being much larger than in the healthy state, and are filled by precisely the same milt-like matter. In a case which I have had occasion to examine, where the Bladder was filled by the milt-like matter, one of the Lymphatic Glands, at the side of the Bladder, had attained the size of the first, so that I at first supposed there had been an unnatural contraction in the middle of the bladder; but found, upon opening the bladder, that there was no communication between the Cavity of the Bladder and the unnatural swelling connected with it.

There is another peculiarity in the Disease, viz. a very remarkable offensive fætor; and the organ containing such a Tumour, is as much discoloured, and emits as fœtid a smell, as the same bowel which had been exposed to the air for several days.

Of the Distinctive Characters between the Milt-like Tumour and the Anomalous Tumour.

1st, The Anomalous Tumour of my Grandfather, differs, as to its situation, from the Milt-like Tumour; the latter is generally connected with a serous membrane.

The Anomalous Tumour is sometimes connected with the Periosteum of the Bones, with the Capsular Ligaments of the Joints, especially with that of the Hip-joint, with the Peritoneum which partly covers the Liver, Spleen, Ovarium, and Uterus, and with the Albuginea and Vaginal Coats of the Testicle; with the Coats of the Optic Nerve, and Sclerotic Coat of the Eye; all of these membranes are Classed among the Serous Membranes.

Sometimes the Anomalous Tumour, or the Fungus Hæmatodes of Mr Hey, is said to take its origin in the Muscles and Cellular substance.

Sometimes it begins as a distinct Tumour.

Sometimes it appears as an enlargement of the part affected.

In its progress it bursts, and a soft dark purple-coloured fungous excrescence rises from the centre, which bleeds profusely, and it increases very rapidly in size in a short time.

The Milt-like Tumour is much softer, it has not the same purple colour and firm elastic feeling as the Anomalous tumour before it bursts, which Mr Burns has compared to a sponge tied up very tightly in a piece of Bladder; and I have never observed any appearance of fungous ulceration of the Milt-like tumour.

The Milt-like Tumour is nearly of an uniform consistence in every part, and the lobes are not so distinct as in the anomalous tumour, which are separated from each other by membranes.

The Milt-like tumour is, in colour and consistence, uniform in every part; whereas the section of the anomalous tumour exhibits, in its different parts, a different colour, and also a different consistence, some being as soft as brain, and others as hard as the yolk of an egg, and others like cartilage; beside, there are frequently cavities within the tumour, filled with fluid tinged by blood.

The disease I have been endeavouring to describe, appears only in advanced life; whereas the anomalous tumour is, in many instances, a disease of infancy, childhood, and of the meridian of life.

Symptoms.

As I have not had an opportunity of seeing a sufficient number of cases of the above disease, in order to form an accurate opinion of the concomitant symptoms, I requested Mr Charles Anderson of Leith, to draw out a history of a remarkable case of this disease, which he attended along with my Father, where the tumour was connected with the great left sac of the Stomach, and which is represented in Plate V.

"*Leith*, 12*th September* 1810.

"Dear Sir,

"In compliance with your request, I now send you a sketch of the Case of diseased Stomach formerly sent.

"Mr —— about 56 years of age, of slender make, temperate habits, and subject to no hereditary complaint, enjoyed uninterrupted good health, till towards the close of the year 1808. On the 13th of January 1809, immediately after dinner, he was attacked, without any evident cause, with sickness and vomiting; in the course of which he ejected eight or ten ounces of Coagulated blood, of a florid red colour. The sickness soon left him; and, by pursuing a proper regimen, together with some aperient and cooling medicines, he was, in a short time, enabled to return to his ordinary business. During the summer of the same year, he never made any complaint; but it was obvious, even to his friends, that he was not in good health. He had acquired a sickly and rather emaciated appearance; notwithstanding which, he thought himself in perfect health. About the end of summer, he began to experience a degree of uneasiness and pain in his Stomach, soon after his meals, which he imputed to impaired digestion; and, of his own accord, restricted himself to a milk diet. By spare diet, he began to experience so great a release from the painful sensation in the region of the Stomach, as to flatter himself that he was cured, and therefore resumed his former mode of living.

"About the commencement of the present year (1810), in consequence of a lameness, produced by a laceration of some of the fibres of the Gastroc-

nemii Muscles, he was confined to his sofa, during which he evidently lost flesh.

"About the middle of the month of March, the uneasiness arising from distention of the Stomach was much increased; and, within a few days, he experienced a fit of rigour, succeeded by increased heat of the body, which attacked him regularly about two o'clock of the afternoon, and continued till between five and six. He suffered five such paroxysms in as many successive days. These yielded to the peruvian bark, combined with the sulphuric acid. He at the same time complained much of the uneasiness and sickness at Stomach, and restless nights; his body was open, and his pulse, which beat about eighty times in a minute, was small and feeble. It was obvious that there was some organic disease in the abdomen.

"The region of the Liver and Stomach were minutely examined, without discovering any trace of disease.

"At this time Dr Monro, senior, was called into consultation with Dr Thomas Anderson. The former said, that he thought he perceived *a swelling towards the left side of the Stomach.* Pulse 88, and regular in his body. After taking into full consideration all the circumstances of the case, it was determined to put our patient on a mild and protracted course of mercury, as the most likely means of removing the disease.

"The mercury was exhibited both internally, and

by friction on the abdomen, and continued for about fourteen days, when his mouth became considerably affected, though without any material change in the state of the complaints.

" Diarrhœa succeeded, and the mercury was given up; notwithstanding which, and the use of opium and astringents, it continued for some time to be very troublesome. After a short time the severity of his complaints abated, and he acquired an increase of strength, by which he was enabled to leave his room. He was also permitted to take a small portion of animal food, which was not followed by any painful sensation in the Stomach; but as the quantity of food taken at any one time was very small, it is rather to this than to any other cause that the ease he now enjoyed after meals was to be attributed. This respite from his sufferings was but of short continuance; for in the beginning of the month of May, they were all so much aggravated, that on the 11th of the month Dr Gregory was joined in consultation with the Gentlemen before mentioned. At this time, as the patient was much distressed with slight diarrhœa, every discharge per anum being preceded by severe griping, it was determined to try the effect of some simple aperient medicine. Magnesia, with lemon-juice, was recommended, which produced no great alleviation of the pain; in addition to that was added a large dose of Opium, combined with Conf. Catechu, administered at bed-time, and occasionally also in the

course of the day, when it was rendered necessary by an increase of the pain.

" In addition to the symptoms noticed (I ought to have added that), about this time he was much troubled with saliva rushing into the mouth, which, from the frequency of spitting, occasioned much trouble. The ptyalism he thought increased when the dose of opium was diminished.

" Under the use of these medicines, I had the mortification to find that my patient experienced no alleviation of his sufferings, which, on the contrary, gradually increased.

" During the mild and serene weather of the Summer, my patient acquired so much strength as to be able to leave his room and to go into the garden; but in a short time afterwards, I observed my patient's strength gradually sink, and his bad symptoms daily increase. Towards the end, his Stomach would receive but small quantities of food at a time; the troublesome diarrhœa became more frequent; his pulse became a little quick, ranging from 90 to 100 strokes in a minute, and very feeble. During the whole course of the complaint, the heat of the skin never rose above the natural standard; he had no hectic sweating, and his tongue was at all times perfectly clean and moist. The emaciation, however, proceeded by slow degrees, reducing him very gradually till the 25th day of August, on the evening of which day he expired.

" The whole circumstances of the case excited

in me a strong desire to inquire into the nature of the complaint, by an inspection of the Abdomen, which was readily granted by the friends, to whom my patient had expressed a desire that such an investigation into the nature of his disease should be made.

" On laying open the Abdomen, I was struck with the healthy appearance which its contents presented. The Omentum, loaded with the usual quantity of fat, was spread over the Intestines, but adhered in one point to the Liver, by a riband-like attachment, of something more than a quarter of an inch broad: at the place of insertion there was no preternatural appearance. The Intestines looked healthy. In tracing them from the Pylorus down to the Rectum, a turn of the Ilium was observed to be covered with a slight and diffused redness extending to the sigmoid flexure of the Colon, and beginning of the Rectum. Two constrictions of the Great Intestines were observed, by which the capacity of the Gut was diminished to one third of its usual size. The Liver, Spleen, and Pancreas exhibited no trace of disease discoverable by handling or Incision.

" I have deferred any account of the Stomach till the end, as the seat of disease was discovered to be in it. On taking this viscus in my hand, I was struck with its firmness, and thickened feeling; and on grasping it more particularly, I found *an unusual largeness, as if of a Tumour, in its sub-*

stance, situated at the greatest curvature, near to the point where it touches the Spleen.

" Having removed this organ from the body, and slit it open, I observed a large *Tumour situated on the Villous Coat,* above the surface of which it projected. It was of *a regular round form, measuring about four inches in diameter.* From the principal mass *several laminar projections issued.* The Structure of the Tumour was fibrous, and in consistence and appearance much resembled the substance of Brain. To me it appeared an example of the Medullary Sarcoma, so well described by Mr Abernethy. But of the more particular appearances and Structure of this Tumour, I forbear to add any further description, as the preparation itself is now in your possession.

" There were *three or four small ulcerations* on the *surface* of the Tumour.

" Wishing you every success in your intended publication on the Morbid Anatomy of the Alimentary Canal,

I am,

Dear Sir,

Yours most sincerely,

CHA. ANDERSON."

The most remarkable circumstance in the preceding case, was the slight degree of pain in his Stomach which the patient suffered, and which

seems to me to be connected with the situation of the tumour, which did not obstruct the Pylorus.

It may not be improper to add, that I had occasion to visit a man along with Mr Allan, surgeon, who was afflicted by the same disease, in his bladder of urine, and who, for ten months before his death, suffered the most excruciating agony, and was often convulsed. My father, many years ago, met with a similar tumour in the bladder of urine.

Whilst the preceding sheet was at press, I received from my late pupil, Dr GEORGE WYLIE of Paisley, the following valuable communication.

"ROSEANNE GRAY, aged 11, of a lively disposition, ruddy complexion, with dark hair and eyes.

"During the earlier part of the spring of 1810, this girl was much exposed to cold whilst sitting at work, and constantly complained of a chilliness, which thicker clothing did not obviate. About the end of March she complained of pain in the head, and especially in the left ear, accompanied by giddiness, which were much increased by exercise. She very soon became weak, and of unhealthy appearance, and for three weeks in April was confined to bed; after which she got a little better. During the summer months, she was now and then so free from her complaints, for a few days at a time, as to be able to stir abroad; and at the worst, was seldom long confined to bed. When able to go out to amuse herself, any exertion caused a return of the

headach and vertigo,—and she felt a weakness at her heart, as she expressed it, which obliged her to sit down.

"About the middle of August her relations first observed that she spoke less distinctly; the neighbours had noticed this much sooner.

"About the end of September I first saw her. She complained of pain in the head and left ear, and giddiness: her deglutition and speech were impaired: the mouth was a little distorted to the right: she breathed none through the left nostril; heard less distinctly with the left ear; and the eye of that side was so full that the eyelids could not completely cover it, yet she saw equally well with them both. She was much emaciated; had little appetite, and was costive: pulse small, frequent, and weak. On looking into the mouth, a Tumour was observed to be situated partly behind, and to the inside of the backmost grinder on the left side of the upper jaw: its base extended to the gum before, and to the velum palati behind, stretching to the right as far as the suture which joins the palate bones. It was about the size of a small nutmeg, and had a groove or depression alongst its middle from before backward. When pressed it was slightly elastic, and had so much the appearance of an abscess as to be repeatedly mistaken for one. It was a little moveable; and when moved, gave a sensation similar to that felt from moving a small hard steatoma.

"Laxatives were prescribed, which greatly amend-

ed the general health. Extirpation was also advised; but the girl and her relations were unwilling that she should submit to any operation.

"The Patient was not again brought to me till the 13th of November. The pains had at times been most excruciating, inducing profuse perspiration. The tumour had increased rapidly, and had become as large as a pippin, was immoveable, and so completely filled the fauces, that liquids were swallowed with great difficulty. It was connected with the gum of the backmost grinders and the tonsil of both sides, and completely hid the velum and uvula. It was larger on the left side, and, from its great projection, depressed the root of the Tongue so as to give the appearance externally of a tumour above the Pomum Adami. By depressing the tongue with a spatula, the uvula was seen to be pushed towards the right, and depending from the posterior part of the tumour. The right half of the tumour was firm; the larger or left half was a little elastic.

"On the 16th, a small oblong superficial ulcer appeared on the fore part of the tumour; a second was in a few days formed by the pressure of an under molaris of the left side: neither of these gave any pain, and they discharged very little; the first healed in a short time. More than the usual quantity of saliva was secreted; and from the difficulty of deglutition, it almost constantly ran from the mouth.

"On the 20th the tumour was observed to be

larger; and the patient breathed and swallowed with extreme difficulty. Inspiration became more difficult in the horizontal posture, especially during sleep, and she was frequently awaked suddenly by it, and had recourse to the semi-erect posture, like one in a paroxysm of Asthma. In a consultation it was agreed that extirpation should be speedily resorted to, for the following reasons: The tumour, though fixed, was at first moveable; from its rapid increase the patient must in a short time have died from inanition or strangulation; the operation would at the least produce a temporary alleviation: And a case occurred lately, in which a similar tumour was removed with success.

"21st. Betwixt the hours of one and two P. M. the Tumour was removed by incision, after being freed from its attachments to the gum and tonsil on the right, and the cheek, gum, and tonsil on the left side. The velum and uvula were removed along with it, which exposed to view a tumour nearly as large as the first; they were connected at their bases, and seemed to be only one tumour with two lobes. This posterior lobe hung, from its attachment behind the velum, down into the pharynx. The effusion of blood, from the wound, was trifling; the pulse 120 and weak; feeling weak and much exhausted. She was put to bed, with the intention of waiting till she became stronger, before any thing further should be attempted.

"The Tumour being cut into, was found to be

of the sarcomatous kind; very like gristly fat in texture, but of a rather whiter colour.

" About an hour after being put to bed, the patient was alarmed by an oozing of blood from the wound: this increased very fast, and before assistance could be got, she had lost a great quantity of blood. Various styptic liquors were applied by a piece of sponge, but although they instantly coagulated the blood, they had not the desired effect. Dry caddis firmly pressed on the wound for an hour, completely subdued the hæmorrhage. She had swallowed a considerable quantity of the blood; had little sleep during the night.

" On the 22d she complained much of sickness, and a burning pain in the region of the stomach, and vomited some dark grumous matter. She swallowed with ease, and spoke tolerably well. Pulse frequent and weak: slept a little. She obstinately refused to take any wine. 23d, She vomited some more of the dark grumous matter; and passed something similar by stool, which greatly relieved the cardialgia. Took some beef-tea and panada for food: slept well. The wound had a putrid disagreeable smell. She became quickly stronger, and continued entirely free from pain. The caddis was removed from the wound on the 26th, and the mouth was ordered to be washed with a watery solution of myrrh. Was able to sit up out of bed on the 27th—her belly being bound, she had four grains of calomel, which relieved her. The pulse

was good: she slept well, and was still free from pain, and amending.

"On the 29th, she was able to walk about the house without support. Her appetite and sleep were good. She breathed easily by the mouth and right nostril. The discharge from the wound, which, for the first two days after removing the caddis, smelled considerably, had become free from fetor.

"December 3d. For two days past she had begun to feel a return of the pains and giddiness. She lost her appetite, and began to complain much of cardialgia and pain in her forehead and nose. A clear mucus was discharged from the nose, and she could not blow it. The face, especially the left side, was much swelled, and occasionally flushed. The tumour behind the velum had increased much. Externally a small conical tumour, hard and immoveable, was observed projecting from below the mastoid process of the left temporal bone. She began to hear less distinctly, and was frequently seized with faintness: was confined to bed.

"On the 4th took an opiate to relieve the pain. She dozed much during the day; but had little sleep at night. Difficulty of breathing returned during sleep. Being costive, she had two drams of Castor Oil, which operated several times, although part was rejected by vomiting. The pulse was 120, full, and pretty strong. She was relieved by the purgative.

"Till the 21st, she had continued to become

weaker, and the severe pain of the forehead had twice recurred, accompanied by swelling and flushing of the face, and profuse perspiration. The breathing, particularly during inspiration, was loud and hissing, and became much more difficult during sleep; so much so as very soon to awake her suddenly, from a sense of strangulation. The tumour behind the velum and the base, from which the anterior one was removed, increased rapidly; and the ulcerated surface discharged a fœtid clear matter, which became the less fœtid the smaller the quantity. Several lymphatic glands of the neck had swelled,—one in particular in the right side was much enlarged. On the 22d and 23d, her face was much swelled on the left side, and frequently flushed. The mouth continued to be distorted, and the distortion seemed to be a little increased by this swelling. The pulse was 120, and remarkably full and strong; for she was able to take but little sustenance. Her left eye continued protuberant: and for two or three days about that time, she saw less distinctly with the left eye. Her belly was regular.

"From that time she became weaker daily; and was often seized with faintings when sitting up in bed. The Tumours increased rapidly, and of consequence respiration and deglutition were proportionally more difficult. She dosed constantly, unless when tormented with pain. As soon as she at any time fell asleep, her breathing became laborious; the difficulty increased with every breath she

drew: she awoke almost suffocated, and stared wildly around her; after drawing a deep sigh or two, she breathed short, was bedewed with perspiration, and only recovered to a distressful repetition of such paroxysms. She was able to take but a little food: and although she had frequent cravings for it, they were of short duration, and sometimes did not last till the food could be prepared. About eight days before her death she heard distinctly. The mouth continued distorted till the last. She was frequently seized with deliquium animi, and her strength gradually declined until her death, which happened on the 27th of January 1811.

"Dissection.—By sawing through the inferior maxilla at the middle, and turning back the left half, after dividing its muscular connections, the Tumour was fully exposed to view. It now appeared to fill the whole of the throat and pharynx. Its base was attached to the palatal plates of the palate bones, to the left of the pterygoid process of the sphenoid and the point of the petrous portion of the temporal bone, where the Eustachian tube issues. Its left side grew to the cheek, the gum, and tonsils,—and sent a sharp process to occupy the space betwixt the angle of the jaw and the mastoid process. Its posterior surface was connected by cellular membrane, to the back of the Pharynx. As it passed the nostrils, it sent a process into each; that into the left was bloody. Upon opening the cranium, the base of the Tumour was observed to have obliterat-

ed the extremity of the Os Petrosum and corresponding portion of the sphenoid bone, causing the Dura Mater over the Cavernous sinus to be elevated as high as the clinoid processes. The left nervus trigeminus could not be traced after it pierced the Dura Mater. The hole which the tumour had made in the bones was roundish, with sharp and rough edges; and was large enough to admit the point of the forefinger. The tumour seemed to have no connection with the orbit. About an ounce of water was found in the ventricles of the brain.

"The Tumour, at its attachments, was firm and almost cartilaginous; but its apex, which rested on the gullet, was soft and friable. The processes which were in the nostrils were as soft as brain.

"Most of the symptoms are well explained by tracing the connections and extent of the tumour. The fulness of the left eye probably arose from the tumour pressing upon the Ophthalmic veins, as they run to empty themselves into the cavernous sinus: thus giving rise to a degree of dropsy of the eyeball. This and pressure on the nerves may account for the pain almost constantly felt in the Eye."

EXPLANATION OF PLATE V.

As verbal description is inadequate to convey a correct idea of Morbid appearances, I employed Mr Syme to make a drawing from the case of the milt-like tumour, which grew from the Stomach, which has been described in the preceding pages, from which this engraving, in aqua tinta, has been taken; and it has been carefully coloured after the original drawing, in order to give a more faithful representation of nature.

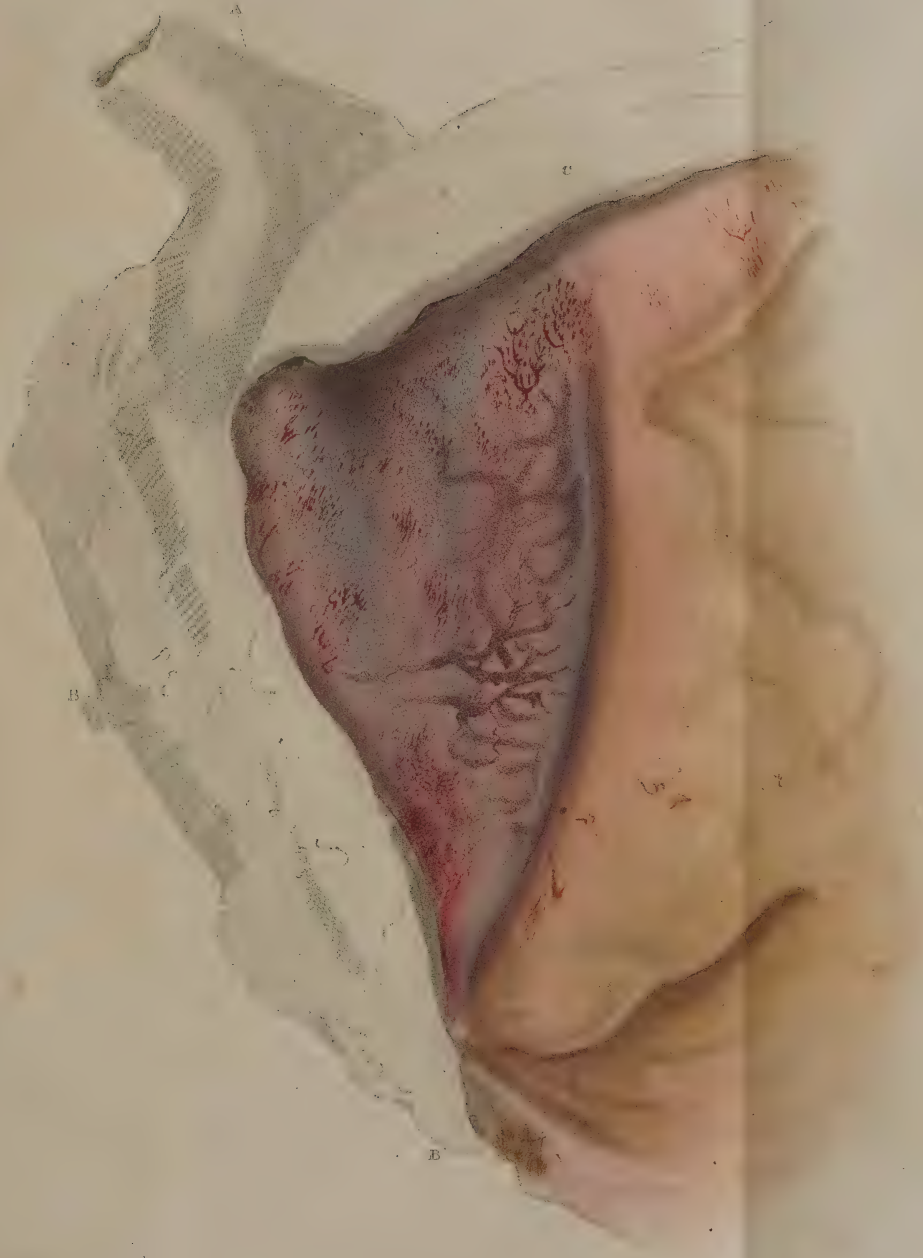
AA, A part of the Gullet.

BB, The Stomach.

C, Part of the Stomach turned back. The coats of this part were much thickened, especially the Villous coat, which has a spongy appearance, has a slight purple colour, and was covered by a plexus of varicose veins, which were much distended by dark purple-coloured blood.

DD, The milt-like tumour growing from the Villous coat of the great left sac of the Stomach. It is composed of distinct lobes, which were of an uniform colour and consistence.

PLATE V.



P. Syme del.t

SECTION VIII.

Of Polypi.

Different kinds of tumours growing from the Mucous Membranes have been arranged under the general head of Polypi, from their being supposed to resemble these insects, which, from having several feet, have been called Polypi; but the analogy is by no means perfect: these tumours being connected to the Mucous Membranes by one root only.

There are the following varieties of Polypi.

The first is a circumscribed tumour, compressible, and moveable upon blowing the nose, of a round or oval form, of a grey or light-brown colour, semitransparent, with a number of blood-vessels distributed upon its surface, soft to the touch, easily torn, sometimes solid, sometimes hollow, and filled by a slimy mucus, much affected by the state of the weather, shrinking in dry weather, and expanding in moist weather; and, when partially destroyed, it rapidly grows again.

Such Polypi generally grow from the Ossa Spongiosa of the nose, or from the Vagina.

This kind of Polypus frequently becomes partially inflamed, by which it sometimes contracts adhesions with the cavity within which it grows, and

then seems to have several roots. This kind of Polypus very seldom degenerates into Cancer.

Richter has described a variety of this polypus, which is tough, of a pale colour; and there is a viscid secretion from its surface*.

The second kind of Polypus is generally a small circumscribed tumour; sometimes it has a narrow, and sometimes a broad basis, of an oval or pyriform figure, of a red or dark purple colour, perfectly opaque, of a fleshy consistence, hard to the touch when within reach, not easily torn, nor moveable on blowing the nose, not at all affected by vicissitudes of the weather; sometimes is stationary, then grows rapidly, and attains a large size; becomes very painful, and sometimes it discharges a bloody mucus, and sometimes bleeds when touched.

This kind of Polypus often grows from the posterior Nares, from the Pharynx, Gullet, Stomach, Intestines, and Uterus.

There are, in some cases, repeated discharges of blood from the tumour when it is irritated, by which the patient's strength is much exhausted.

Polypi, in many cases, fill up the cavity in which they are implanted; and sometimes extend beyond it; and the projecting part expands to a much greater size than the body of the tumour. Ow-

* This kind is most frequent in the nose, and is rather an elongation or relaxation of the Mucous Membrane of the Nose, than a Polypus.

ing to the continued pressure of the tumour, the Membranes ulcerate, the neighbouring bones are sometimes destroyed; thus, when the investing membrane of the Ossa Spongiosa of the Nose is destroyed, the bones become carious, for they cannot, on account of their thinness, exfoliate.

Sometimes the bones of the Nose are disunited.

This kind of polypus, when divided, is found to be solid, and in some places fibrous, and resembles, in colour and consistence, the unimpregnated uterus, and is pierced with numerous blood-vessels.

There are a few small cavities in some of these tumours*, which are filled by lymph †.

There is a variety of this species of Polypus, which consists of a number of distinct lobes of different sizes; and when a section is made of such a Polypus, a small quantity of a fatty substance is found intermixed with the inspissated lymph.

A very excellent specimen of this kind of Polypus is preserved in the Museum of Edinburgh, which grew by a narrow root from the Membrane of the Pharynx, and which filled and distended to a great degree the whole of the œsophagus ‡.

In the old and debilitated, this kind of Polypus sometimes assumes a malignant aspect, becomes

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* Vid. Plate XIII. of my Thesis, De Dysphagia.

† Vid. Plate XIII. of my Thesis, fig. 1st, 3d, and 4th.

‡ Vid. Figure of this Polypus in the Edinburgh Physical and Literary Essays, Vol III.

rough on the surface, bleeds frequently and profusely, discharges a fœtid sanious fluid, becomes also extremely painful, ulcerates, and is at length converted into a genuine Cancer.

There is a third kind of Polypi which are soft, which, in colour, resemble coagulated blood, and discharge blood even upon being slightly touched, and which, in the old and debilitated, frequently degenerate into Cancer.

Before proceeding to describe the symptoms occasioned by Polypi, it may not be improper to observe, that these tumours grow much more frequently from the Mucous Membrane of the Nose, Pharynx, and Uterus, than from that of the Gullet, Stomach, or Intestines, or Bladder of Urine, which illustrates the following observation of Dr C. Smyth *. "There is great reason to believe, that the structure of those Mucous Membranes is somewhat different in different parts, according to the various purposes of the animal economy."

Polypi in the Pharynx.

Polypi frequently are attached to the internal membrane of the Pharynx, to the posterior Nares,

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* Vid. Lond. Med. Communic. Vol. II. p. 206.

or cuneiform process of the Occipital Bone, and occupy a part of the cavity of the Pharynx.

Polypi within the Pharynx give rise to the following symptoms: The breathing and deglutition are more or less interrupted in proportion to the bulk and length of the tumour; by their pressure on the Eustachian tubes, they create dulness in hearing; and by impeding the free return of blood from the head by the Jugular Veins, occasion considerable headach, vertigo, and drowsiness *.

The partial enlargement of the Cervical Vertebræ, occasions a swelling in the Pharynx not unlike to a Polypus.

My Father was lately desired to visit a Lady, who had been his patient about twenty years ago, on account of a Polypus which grew from the soft Palate, and which was removed by the knife †. She supposed that she again laboured under the same

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* I have known patients, in this situation, treated as if they were about to be seized with apoplexy.

† Polypi may be also removed by Ligature. In my Thesis, De Dysphagia, I have observed, "Levret polypos uteri ac vaginæ, ligaturâ excidendas suadet: illi tamen videbatur modum operandi, quem descripsit, non posse adhiberi ad polypos in gutture natos tollendos. Quùm verò Patri meo videbatur, polypos, in locis præcipuè arctis sitos, exscindi aut forcipe evelli non posse, sine gravi injuria partibus vicinis illata, hæmorrhagia enormi, ac tumoris renascendi periculo, ob radices ejus relictos, ligaturam, in omni ferè casu, excisioni aut evulsioni prætulit; atque per triginta annos elapsos, varios modos quibus secundum

disorder, but she was mistaken, the swelling in the Pharynx being perfectly hard, and occasioned by an enlargement of the anterior parts of the bodies of three of the Cervical Vertebræ.

Of Polypi of the Gullet.

A very remarkable case of this kind is preserved in the Museum of Edinburgh, of which the following is the history*.

"James Davidson, aged 68, was admitted into the Royal Infirmary, April 9, 1763, for the cure of a polypus in his throat.

"Upon examining his throat, there was nothing preternatural perceived; but, on giving him a vomit, or irritating the fauces, so as to make him retch, a large fleshy excrescence was thrown up into his mouth, as far as to his fore teeth, consisting of four different fangs, joined together by one com-

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tumoris situm, adhiberi possit, auditoribus suis in cadavere demonstravit, argento nitrato posteà polypi radici admoto, atque variis exemplis ægrotantium illustravit, in quibus, exitu secundo, operatio sic instituta erat.

"Inspiciat lector Tab. III. fig. 2. Tab. VI. XII. et XIII. ut tumorum naturam, instrumenta his tollendis adaptata, atque operandi modum, intelligat."

* Vid. Edinburgh Physical and Literary Essays, Vol. I I. p. 525.

mon root. These were of a pretty firm fleshy texture, possessed of a good degree of elasticity. He could hardly allow them to remain half a minute in his mouth, as they shut up the larynx, and thereby entirely stopt his breathing.

" This polypus had, for several years, prevented him from swallowing any thing without much difficulty; neither could he breathe so freely, nor speak so distinctly as usual; it likewise occasioned a cough, which frequently forced the polypus into his mouth.

" On the 15th of May last, while Mr Dallas attended the Infirmary, the result of a consultation was, that bronchotomy should be performed, that he might breathe by the opening made in the trachea, till such time as I should get a noose cast on the polypus. This method of cure, suggested by Dr Monro junior, was the most rational; for the extracting of it would have been improper, because the hæmorrhage could not have been stopped, besides the danger there was of pulling away the inner coat of the œsophagus.

" By means of a ligature passed through a hollow ring, to which a long stalk was connected *, a large part of the tumour was removed, which was discharged by stool."

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* For a more particular description of the apparatus, Vid. Edin. Med. Lit. Essays, Vol. III.

The sequel of the case was published by my Father. "The patient died in the Royal Infirmary, in April 1765, to which he had returned, a few weeks before that, very feeble and emaciated; as for several months past he had not been able to swallow any solid food, and even swallowed fluids with much difficulty.

"The polypus had not, however, been seen by the surgeons who had examined his throat.

"On dissecting his body, the œsophagus was found to be greatly dilated by a very large fleshy excrescence or polypus, which grew out from its fore part, by a single root, about three inches lower than the glottis, but was split at its under part into several lobes, the largest and longest of which reached down to the upper orifice of the stomach.

"On viewing this figure (alluding to the figure in the Physical and Literary Essays, Vol. III.) it is evident, that when, by the effort of vomiting, the polypus appeared in his mouth, its parts must have been inverted, or that the lobe which was longest, and generally undermost, had been thrown up into the mouth. And, as a certain proof that such inversion had actually happened, a cicatrice could be distinctly observed at the under end of the longest lobe, from which the four branches or fangs mentioned by Mr Dallas had been cut off, by the ligature he had applied.

"It is probable that the increase of the polypus,

during the two last years of the patient's life, had prevented its inversion and appearance in the mouth, and, at the same time, added much to the difficulty of swallowing."

Of Polypi in the Stomach.

This is a very rare disease.

These tumours, when situated near the pylorus, by preventing the free egress of the contents of the Stomach, increase its size, and change its figure*.

My father met with a remarkable case of this kind some time ago, of which he gave me the following relation.

" A Lady, ætat. 45 (1802), the mother of several children, about 16 years ago was attacked by paroxysms of difficult breathing, which had ceased about an year before I visited her.

" She then complained of pain in the Epigastric Region, indigestion, and wind in her Stomach and Intestines; her Body was loose, her menses irregular.

" She had of late lost much of her colour, flesh, and strength.

" The above symptoms gradually increased. Up-

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* Vid. Plate VI. and also a case of Tumour of Stomach, Morgagni, Epist. 30. art. 7.

on examining the belly, a tumour was found on the right side of the navel, of an oval shape, and about the size of an orange; which at the time was supposed to be lodged within the colon.

" Medicines were found to afford no relief; her complaints continuing without abatement. She died much emaciated.

" On examining her body after death, the Stomach was found to have fallen down as low as the navel; upon opening it, there appeared a tumour adhering by a neck to its Villous Coat. The surface of the tumour was smooth, and the body of it so firm, solid, and tough, that it was cut through with some difficulty." Vid. Plate VI.

The section of this polypus exhibits an uniform substance.

The Stomach was much enlarged, and of an unusual figure, of which Plate VI. conveys a better idea than verbal description.

Polypi have been sometimes found within the Intestinal Canal, especially in the large Intestines. I had occasion to see a case, in which a Polypus in the Sigmoid Flexion of the Colon filled up the cavity of that Intestine so completely, as hardly to give passage to a goose's quill.

In another case, the middle of the arch of the Colon was nearly filled by a spongy excrescence.

Rhodius has made mention of a similar case*;

* Vid. Act Hafn. Vol. IV. p. 1 and 86.

and Fantonus has observed, that he found within the Colon of a Dysenteric patient, a polypus, eight inches long, and which weighed a pound, connected by a narrow peduncle.

These polypi create colicky pains, by obstructing the Intestines, and impeding the progress of the fæces.

Portal makes mention of two cases in which he found the Polypi within the Colon, which almost entirely plugged up its Canal, and which were connected to it by narrow necks *.

Both persons suffered severely from pain in the Intestines, had frequent vomiting, were subject to obstinate costiveness, of considerable duration, and died from Marasmus, and the portions of Intestines above the tumours were much dilated.

Such Polypi have in some cases been discharged by stool, after occasioning the symptoms above enumerated †, but often the patient obtains only a temporary relief; for there are generally more Polypi within the Intestine, and in consequence of the enlargement of these, the Intestinal Canal is again obstructed. Portal has related a case of this kind; the Polypi proved the cause of death, and upon dissection, several of these of different sizes were found within the Colon.

In cases of Cancer at the Pylorus and Rectum, I have seen a number of small tumours of different

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* Vid. Portal Anat. Med. Tom. V. p. 243. † Ibid.

sizes, with narrow necks, which gave rise to symptoms nearly similar to those just mentioned.

Polypi in the Rectum somewhat differ in appearance from those already described, being generally smaller in size, and two, three, or even a greater number, are sometimes found in the same subject; and when a patient is at stool, they sometimes project beyond the verge of the Anus.

A considerable degree of constriction in the Rectum is described by Dr Stark, as being produced by soft, spongy, rotten tubercles*.

In illustration of the symptoms occasioned by a Polypus of the Rectum, I have subjoined the history of a patient who was afflicted by that disorder, which was communicated to me by Mr Johnston, Surgeon, who attended the patient along with my Father.

"*May 5th*, 1810.

"Mrs ———, about 50 years of age, a considerable part of which was spent in the West Indies, where she became the mother of several children. During her various pregnancies, she enjoyed very indifferent health, being in particular, much and violently afflicted with piles. About ten or twelve years ago, she began to complain of constant uneasiness in the Rectum, with occasional Prolapsus Ani. These symptoms, by degrees, grew worse;

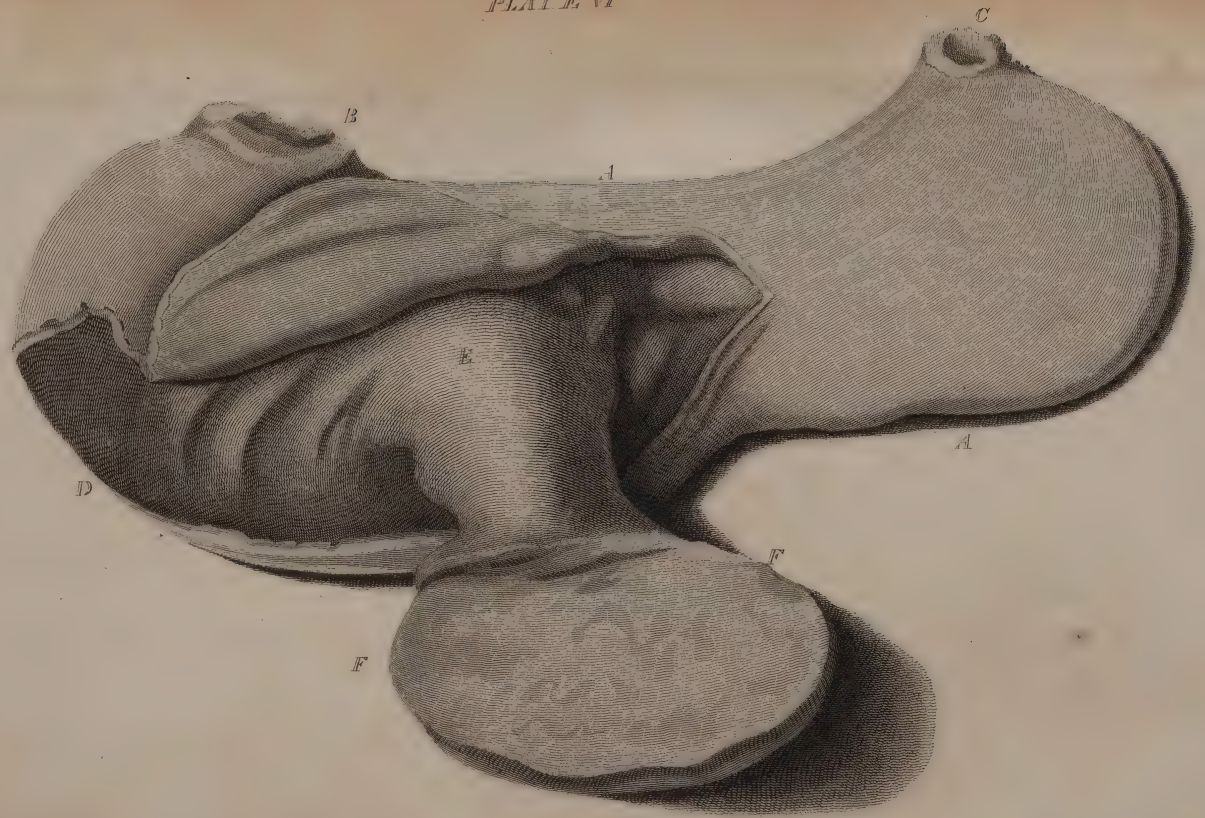
* Vid. Stark's Works.

frequent attacks of very severe inflammation of the parts took place, with profuse discharges of blood, and the Prolapsus became almost constant, unless retained by a bandage The violence of these complaints greatly injured the general health, and in particular the functions of the Stomach and Intestines were much affected. Upon examination of the parts during a complete Prolapsus, a firm fleshy-looking tumour was found within the sphincter, about the size of a chesnut, with a broad base. It was proposed to remove this, but at first this was not consented to. The symptoms of distress continued daily to grow worse, and the health of the patient became so precarious and infirm, as to induce serious apprehensions for her life; in consequence of which, by great entreaty, she at last consented to the removal of the tumour: this was done without any difficulty, by means of ligature. She suffered much agony during the strangulation of the tumour, and indeed for a considerable time after it dropt off; much inflammation and sloughing were endured, and for a week or ten days, appearances were rather formidable. By degrees, however, the inflammation subsided, the parts became easy, the Prolapsus Ani was quite removed, the functions of the Stomach and Intestines became more natural, and since that time, now nearly two years, her health has gradually mended, and is at present much better than at any time for the last twelve years of her life. She has had no hæmorrhoidal attack since the removal of the tu-

mour; no discharge of blood; nor has she any feeling in the parts which indicate any remains of disease there."

This case distinctly proves that a Polypus is a local, and not a constitutional disorder, for the disease was completely eradicated by the operation, and did not return; and in further corroboration of the above opinion, it may not be improper to add, that in my Father's Case Books there are several instances, in which Polypi have been removed from the Nose, Uvula, Pharynx, and Uterus, and where there has been no return of the disease for five, ten, nay for twenty years.

PLATE VI



Fyfe del.t

James Heath sculp.t

EXPLANATION OF PLATE VI.

The figure in this plate (which is one half of the size of nature) was taken from the Stomach of the Lady whose case has been described in page 189, and which contained a Polypus; and a section of the tumour was made in order to exhibit its internal structure.

The Coats of the Stomach were of the healthy appearance, excepting at that place from which the tumour grew; there they had attained an unnatural thickness and spongy appearance.

The Stomach is by no means of the natural shape, for, instead of resembling in figure the Human Stomach, it resembles that of the Rhinoceros.

AA, The Stomach.

B, The Cardia. C, The Pylorus.

E, The neck of the Sarcomatous Polypus which grew from the great left sac of the Stomach.

FF, The tumour, which was of a pale-red colour, was divided nearly into two equal parts.

SECTION IX.

Of Fatty or Steatomatous Tumours.

These have occasionally been found within the Gullet*, though more frequently within the Stomach† and Intestines.

It seems to me probable, that the observations which Vic d'Azyr has made upon this subject‡ are well-grounded; but I speak only from conjecture, as I have not seen in any Anatomical Museum an example of this organic disease of the Villous Coat of the Alimentary Canal.

Such tumours, when within the Stomach, have been said to occasion nausea, vomiting, obstinate constipation, pain in the region of the Stomach, and sometimes Jaundice.

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* Vid. Portal, Anat. Med. Tom. IV. p. 539.

† Vid. Portal, Anat. Med. Tom. V. p. 196; also Rhodius, Obs. 103.

‡ He has observed, in the second Volume of the Encyclop. Methodique, p. 343. "Il eût peut-être convenu de placer, comme a fait M. Lieutaud, les *stéatomes de l'estomac* dans un article séparé de celui des squirres de ce viscère; mais indépendamment de ce que cet auteur ne cite que trois exemples de ces tumeurs enkistées, il n'a eu aucun soin d'en examiner de près le caractère; et ce qu'il dit du troisième cas paroît si vague, qu'il est au moins fort douteux que la tumeur qui en est le sujet, fût un *stéatome*."

SECTION X.

Of Fungus of the Villous Coat of the Alimentary Canal, and of Fungous Tumours connected with that Membrane.

Fungous Tumours have been observed in every part of the Alimentary Canal.

Such tumours are generally of a small size, of a very soft consistence, bleed when torn, and generally are composed of several small lobules.

I have seen the Uvula and upper part of the Pharynx covered by a crop of such tumours, of a small size; and the Membrane from which these grew, was of a dark purple colour, and seemed considerably thickened, and was in some places eroded. Ulceration also sometimes takes place, and the fungous tumours often assume a malignant aspect.

My Father met with a case of fungus of the Pharynx, which occupied a considerable share of the Internal Membrane of the Pharynx, and also of the upper part of the Gullet, which was thereby very much thickened, and the patient died from inanition: and an ulceration had taken place in some of these fungous excrescences.

Dr Baillie has described a case of fungus of the Pharynx, which, when cut into, appeared to have a fibrous structure, disposed in some measure at right angles to the inner membrane, upon which it was formed, and was ulcerated on its surface.

Razoux has described what he calls a Fungous Tumour. "Nous trouvâmes une espèce de *fungus* d'un pouce et demi d'épaisseur, qui bouchoit exactement l'orifice inférieur de l'estomac; c'étoit une excroissance formée par plusieurs couches l'une sur l'autre, qui partoient toutes du pilore, comme d'une racine ou d'un pédicule commun, et venoient s'épanouïr sur la surface de l'estomac. Ce *fungus* étoit composé de cinq à six couches assés distinctes d'une substance membraneuse et charnuë; elle étoit dure en certains endroits, et paroissoit presque calleuse*."

In ten cases, my father found the Villous Coat of the Stomach or of the Intestines in a fungous state, when before death there had been a discharge of a large quantity of black bile.

When the Villous Coat has been reduced to this condition, it assumes a pulpy appearance, is much softer, thicker, and redder than usual, and very irregular on its surface.

The distinction between the sound and diseased part is generally very manifest, the latter having at its edges a puckered appearance.

These Fungous Tumours sometimes pass across the bowel within which they are lodged, as took place in the case from which Plate VII. was taken; the Colon was thus divided, and the fungous tumours

* Vid. Tables Nosol. &c. p. 279.

were of different sizes, and some of these were nearly as large as small walnuts.

The Villous Coat has sometimes been reduced to a fungous state, when albuminous matter has been deposited between the Coats of the Stomach, and still more frequently in cases of Scirrhus, or Cancer of the Gullet, Stomach, or Intestinal Canal *.

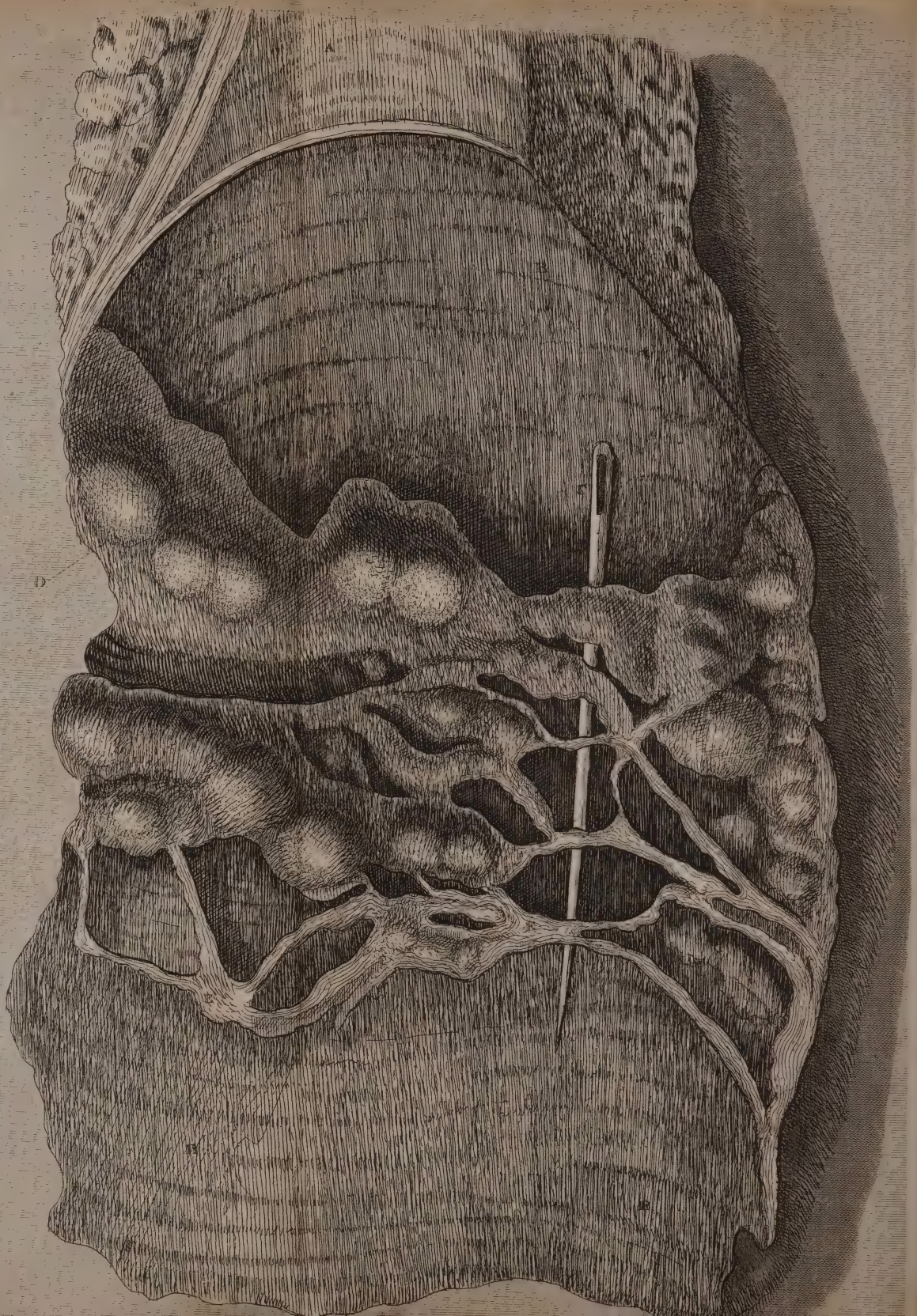
The Fungus of the Villous Coat of the Gullet gives rise to difficult deglutition, with a sense of soreness and pain in the part, which are much augmented during the effort of swallowing even the mildest substances, and there is occasionally a bloody mucus spit up; and when fungous excrescences attain a large size, these obstruct the Gullet so much, that the patient dies from inanition in a short time.

When the disease is seated in the Stomach, there is great pain in the organ affected, with all the usual symptoms of indigestion, very frequent nausea and vomiting, and the occasional rejection of blood by vomiting, and the patient dies completely exhausted.

The fungus of the Villous Coat of the Intestines occasions great pain in the bowels, purging, a painful distention of the Colon, and the discharge of blood along with the fæces. On account of the great distention of the Colon, and size of the fungous tumours within it, as in the case from which Plate VII. was taken, the patient was supposed by

* Vid. Plate IX.

my Father, at his first visit, to labour under a concretion within the Colon. But on a more accurate examination, he was persuaded, from the softness and inequality of the surface of the tumour, the pain the patient almost constantly suffered, the great discharges of bloody matter by stool, and the emaciation of the patient, that there was a fungous excrescence growing from the Villous Coat of the Colon.


A
B
C
D

EXPLANATION OF PLATE VII.

This Etching represents a cluster of Fungous Tumours of different sizes, which stretched across the Colon, and which, by intercepting the passage of the contents of the Colon, had occasioned a very considerable distention of that bowel.

The preparation was obtained from the body of an old man, who was my Father's patient during the several years he laboured under this very distressing disorder.

A, The Colon.

B, B, B, B, The part of the Colon which had been very much distended.

C, A Probe passed under the chain of Fungous Tumours D, which stretched across the Colon.

SECTION XI.

Of Hæmorrhoids.

Besides the more common Hæmorrhoids, which are described under the head of Varicose Tumours, there is another variety, which is a solid Tumour, incompressible, not painful on pressure, and which does not discharge blood. These Tumours are generally of an oval figure, about the size of an olive, and appear internally, as well as around the verge of the Anus; and I have seen them cut off by the knife, without a single drop of blood being lost.

These Tumours, when divided, seem to be composed of an indurated jelly; and there are generally small cavities within them, capable of containing a Millet Seed, which are filled by Mucus.

Such Hæmorrhoids occasion the same symptoms as the more common Varicose Hæmorrhoid, but do not discharge blood.

It has been stated, that such Hæmorrhoids are sometimes reduced to a scirrhous state.

SECTION XII.

Of Varicose Tumours.

The Veins of the Villous Coat of the Alimentary Canal sometimes become Varicose.

I had occasion to see a case, in which the Veins

of a part of the Villous Coat of the Stomach attained a very unnatural size; one of these gave way, and a large quantity of blood was lost. The Veins of the Intestines are also sometimes Varicose. "J'ai vue (says Petit,) tout l'interieur du rectum jusqu'à le S du Colon variqueux*."

There is a species of Hæmorrhoid which belongs to this class of diseases. The Tumour consists of a plexus of varicose veins; is of an irregular form, of a deep purple colour, soft and compressible, and occasionally discharges blood when the patient goes to stool; and sometimes so much blood has been thus lost as to endanger the patient's life. The celebrated Copernicus is said to have died from the large quantity of blood which he thus lost. The openings from which the blood is discharged may be observed. There is some variety as to the situation of such Piles; in many instances they are external, and situated round the verge of the Anus, but in others internal, and covered by the inner membrane of the Rectum, and a thin tender skin; and cannot be seen until the patient makes an effort as he does at stool, and inverts the Rectum.

Piles are of different sizes at different times, most of them are not larger than an olive; and upon the flow of blood from them being stopped, they swell out considerably.

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* Vid: Op. Posthum. Tom. II. p. 83.

But all such Varicose Tumours do not discharge blood, and these have been called blind Piles.

From the continuance of the disorder, the Coats of the Pile become gradually thicker, so that at length these swellings assume a fleshy appearance.

Of the Symptoms.

The Symptoms of Piles, (the consequence of costiveness,) are, a sense of weight, compression, and pain in the fundament, extending to the back, and loins, which is much aggravated by walking, riding on horseback, or even by sitting on a hard chair, and during the evacuation of the fæces. In some cases, pain in the bladder and suppression of Urine also take place.

The Piles sometimes burst when the patient is at stool; thus a small quantity of blood is lost, which affords much relief*.

The above symptoms are preceded by vertigo, headach, nausea, sickness at stomach, flatulence, colick, and pains in the loins.

Internal Piles create less pain than the external, as the surrounding parts are more yielding and elastic, and not compressed by a Sphincter Muscle; and many patients suffer no other inconvenience from

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* According to Hippocrates, the bleeding Pile is a safeguard against other diseases. Vid. Aphor. XI. and Aphor. XXI. § 6.

this disorder, excepting the loss of a small quantity of blood when they are costive.

The blood from Piles has sometimes been effused into the cellular substance around the Rectum; a suppuration has followed: and the matter bursts externally, occasioning the Fistula Ani.

SECTION XIII.

Of Stricture occasioned by a transverse fold of the Villous Coat of the Alimentary Canal.

In all the cases of Stricture of the Gullet, Stomach, or Intestines, which I have seen, (with the exception of those in the Musea of Dr Baillie and Mr J. Hunter), all the Coats of the part affected have been constricted, so that there was an appearance as if a cord had been drawn very tightly around the diseased part of the Alimentary Canal.

Dr Baillie has described a species of stricture, which originated from a puckering of the internal membrane of the Gullet, and which caused so great a straitening, that a garden pea passed with great difficulty. The patient had laboured for several years under a difficulty of swallowing.

Mr E. Home has described at great length *, and represented by an engraving, a stricture somewhat

* Vid. Pract. Obs. on Strictures, Vol. II. p. 407, &c. 3d edit.

similar, which was seated in that part of the Gullet which is behind the Cricoid Cartilage of the Larynx.

The stricture is in this case very narrow, and being produced solely by a "membraneous partition across the Canal *," excepting at one part, where there is a narrow passage through it, the Coats of the Gullet surrounding the stricture are but little thickened, and the internal membrane beyond it was in a healthy state; hence this kind of stricture may be removed by the caustic, as Mr E. Home did in several cases.

Mr Home has added, that the Rectum is liable to the same kind of stricture as the Gullet, and in some instances, is capable of being relieved by the same mode of Treatment, Vid. p. 418.

There is a species of stricture which is commonly found in the Rectum, which is occasioned by membraneous filaments passing across it. This kind of stricture produces a great deal of irritation, pain, and the discharge of a quantity of viscid liquor along with the fæces, and also blood, when the stricture has been rudely touched.

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* These are Mr Home's words.

SECTION XIV.

Of Aphthæ, or of the Thrush.

This disorder, which is idiopathic or symptomatic, and sometimes infectious, generally appears in the form of white specks, which are surrounded by a red circle, upon the palate or back part of the tongue of infants. These Aphthæ gradually spread all over the mouth, and from thence to the neighbouring parts; and there have even been instances where they have extended to the Stomach and Intestines. But Aphthæ are sometimes of a dirty yellow, green, or black colour, and vary in size: some are about the size of a millet seed, others considerably larger; and in the middle of the Aphthæ, there are small apertures, from which a viscid mucus is discharged.

Aphthæ are covered by a thin skin or pellicle, which is very readily detached as a dry scale; and when detached, the surface is left in a very irritable state.

In some cases, we meet with only two or three of these specks, but in other instances, they are collected into groups, and run into each other, so as to form, in cases of bad fever, a thick dense crust of a grey, yellow, or black colour, which adheres firmly to the part it covers. The Thrush is symptomatic of exanthematous and putrid Fevers, and of many inflam-

matory disorders, and is very frequent among children at the breast, when the milk disagrees with them. This form of disease has passed under the name of Lactucimen, and is sometimes infectious.

The symptoms which accompany this disorder are various, according to its seat. Aphthæ in the mouth and throat occasion copious salivation and swelled tongue, and fever; they also impede mastication and deglutition, and prevent the child from sucking: when they extend to the Stomach and Intestines, occasion considerable pain, a sense of burning acid eructations, colicky pains, diarrhœa, great debility in children, and even convulsions and death: and in adults, they are generally accompanied by the miliary eruption.

SECTION XV.

Of Small-Pox Pustules within the Alimentary Canal.

Small-Pox pustules have been described within the Alimentary Canal.

These I should suspect to be extremely rare; because, though I have had an opportunity of examining the bodies of several patients who have died from the most virulent kind of the Confluent Small-Pox, I never have observed Small-Pox Pustules on the Villous Coat of the Gullet, Stomach, or Intestines.

Vic d' Azyr has made an observation relating to this subject, which is probably well founded—" dans certains cas on a confondu sous le nom de pustules, des tubercles enflammes et suppures*."

SECTION XVI.

Of the Deposition of Cartilage and Bone upon the Villous Coat of the Alimentary Canal.

A SMALL portion of the Coats of the Alimentary Canal has been occasionally converted into Cartilage, and even into bone, or Cartilaginous Tumours have grown from these; and such organic derangements are most common in the Gullet†, or in the

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* Vid. Encylop. Method. Tom. II. p. 342.

† Metzger, in his Advers. Med. p. 176 and 177, has thus described an ossification of the gullet. The patient, a postilion, who was much addicted to dram-drinking, lost the power of swallowing solids, and at length even fluids would not pass: " Discisso per longum canali (œsophago) parietes non solum *ossefactos*, sed et crassitie plurimum auctos cernere erat; et quod rei caput est, villosa nervea, at duplex musculosa œsophagi tunica, cum cellulosa circumjacente, ab organica sua strictura ita degeneraverant, ut unam eamque inorganicam ostenderent massam.

" Vicinæ glandulæ ex conglobatarum genere duræ erant et atræ."

Dr Walter of Berlin has described, in his Catalogue, No. 1536, a still more remarkable case in these words: " Pharynx cum œsophago quatuor pollices supra cardiam præter naturam angustato,

Rectum or Colon*. Cartilaginous Tumours generally appear in the form of small irregular Tumours, which grow from opposite sides of the part affected, which intrench upon the cavity of the Rectum, and act somewhat like valves.

This organic derangement seldom proves fatal, until it has made considerable progress, and until it has involved all the coats of the part affected; so that a doubt may be entertained respecting the original seat of the malady; and as I have seen the ossification of muscles much more frequently than that of a Mucous Membrane, I am disposed to conclude, that the disease took its origin rather in the muscular than in the Villous Coat of the affected part. This species of constriction gives rise to considerable expansion of the parts above the seat of the disease; the valvulæ conniventes are in such parts of the Intestinal Canal very indistinct.—We observe also symptoms of inflammation in the Villous Coat in many cases; and in others, an ulceration of a malignant species, which is frequently suc-

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et in cujus superficie interna, undecem lincas infra hanc angustationem, concrementum osseum unum et dimidium pollicem longum, decem lineas latum hæret. E. quinquagenario."

* Vid. Short, Edinb. Med. Essays, Vol. IV.; also Com. Leipsic, Tom. XX. p. 317; also Gion de Letter, Tom XXI. p. 143.

De Haen has described a case where part of the Stomach was converted into Bone.

Vid. Rat. Medend. Tom. IV. cap. 1.

ceeded by erosion, and considerable destruction of the neighbouring parts, and, in some cases, by the destruction of the cause of the stricture.

Of the Symptoms.

Metzger's case gives a good idea of the symptoms of this organic affection of the Gullet.

When the Intestines have been reduced to this morbid condition, the patient suffers pain in the diseased part, has also a sense of fulness and weight; the pulse is quicker than natural, there is almost a complete obstruction to the passage of the fæces, which are discharged only after the exhibition of some acrid purgatives, and the patient at length dies from inflammation of the Intestines in consequence of the obstruction.

The following are the concomitant symptoms of the Cartilaginous stricture of the Rectum: Slight difficulty of making water is sometimes the earliest symptom; this is followed by nausea, impaired digestion, colicky pains, tenesmus, and habitual costiveness. The fæces have not their usual size and shape, but resemble small earth-worms, and are expelled only after a considerable effort; and when the patient is very costive, blood is sometimes discharged with the excrement; and generally a quantity of fœtid mucus, ichorous, or purulent matter.

When the disease has been of some duration, solid fæces cannot pass; the contents of the Intestines are

discharged in a liquid form, and even these are passed only after a considerable effort.

The nature of the disease may frequently be ascertained by the finger in ano, or by the bougie, the introduction of which generally gives the patient considerable pain.

This disease sometimes gives rise to the Fistula Ani.

Before concluding the history of the organic derangements of the Villous Coat of the Alimentary Canal, it may not be improper to add, that when that membrane has been exposed to the air, as in cases of Prolapsus Ani, or when the Mucous Membrane of the Uterus and Vagina is exposed to the air, from the inversion of the Uterus or Vagina, the Mucous Membrane attains an unnatural thickness, and loses its former sensibility.

SECTION XVII.

Of the Organic Derangements of the Cellular Coat of the Alimentary Canal.

The Cellular Coat may be inflamed in consequence of preceding inflammation in the other Coats of the Alimentary Canal, or it may be the primary seat of the inflammation.

The progress of this inflammation is in different instances more or less rapid; the action of the ves-

sels being on some occasions much increased, but on others more languid. In the former case, there is much pain and heat in the Colon, but in the latter, little pain or heat are perceptible.

The nature of this inflammation was not unknown to Galen *, who has given a faithful portrait of it in his chapter De Tumoribus, but he has taken no notice of its frequent termination in suppuration, or of its more rare termination in gangrene. Before the vessels of an inflamed part take on what may be called the suppurative action, the symptoms enumerated by Galen are aggravated, and when suppuration has taken place, the pain and heat abate, a sense of weight and heaviness is felt in the part, the symptomatic inflammatory fever ceases, and the patient is affected by hot and cold fits, after which a sweat breaks out.

Abscesses have been observed in every part of the Alimentary Canal, either as the effect of preceding inflammation of the organic diseases of the Coats of the Alimentary Canal, or from extraneous bodies which have been accidentally swallowed.

Abscesses are more frequently found in the Rectum than in any other part of the Alimentary Canal;

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* "Hoc phlegmones nomen Græcis dici consuevit, de carnosis partibus, majorem in molem, cum tensione, renixu, dolore pulsatorio, calore et rubore extuberantibus."

Vid. Galen, De Tumor. præter Natur. Lib. i. cap. 11.

as that bowel, from its office, situation, and connection with other parts, is very frequently thrown into a morbid state: thus the Rectum sometimes becomes ulcerated from internal Piles, from Condylomata, from lumbar abscess, from carious Os Sacrum, and from diseases of the bladder of Urine and Uterus.

After an abscess has been formed, the absorbent vessels are much stimulated to act, and erosion follows; by which a communication is established between neighbouring parts, which in some cases abridges, but in others tends to prolong life. Matter passing from the gullet into the windpipe, or from the Stomach into the cavity of the pleura, generally proves fatal in a short time; but when the contents of the stomach, in a case of obstructed Pylorus, pass into the Colon, or are discharged by an unnatural Anus in a case of strangulated hernia, life is prolonged, not destroyed, by the unnatural communication.

Of the Concomitant Symptoms.

In addition to the symptoms which characterize the formation of matter, as the pain becoming less acute, pulse becoming slower and fuller, rigors, sense of pulsation, &c. there are symptoms which indicate the particular situation of the abscess.

Where suppuration takes place in the Pharynx, or Gullet, the patient breathes and swallows with pain and considerable difficulty.

An abscess in the Stomach occasions a loathing of food, a sense of heat, fulness, of weight and pain in that organ, heartburn, nausea, obstinate vomiting, and the contents of the stomach are often mixed with blood. Beside the above symptoms, there is fever, and marasmus; and an unnatural tumour may in some cases be perceived in the region of the Stomach, upon an attentive examination.

Long-continued and obstinate colic, bilious diarrhœa, and the occasional admixture of purulent matter, characterize an abscess in the upper part of the Intestinal Canal.

Abscesses frequently take place in the vicinity of the Rectum, from the Inflammation of the coats of that bowel, and also from that of the cellular substance around the Rectum, or from diseases of the neighbouring parts. The abscess, therefore, is subcutaneous, or deep-seated. Sometimes the abscess bursts only externally, and leaves a narrow Canal, which has a red and callous orifice, a smooth internal surface, and is not disposed to heal; at other times, the skin around the anus is not affected, whilst the abscess denudes the Rectum, and communicates with it by a narrow aperture; and frequently the abscess bursts externally, and also into the Rectum; the first has been called commonly the external, and the second, the internal, blind, or incomplete Fistula, and the third, the Complete Fistula.

The following symptoms are commonly observed,

when abscess is about to be formed in the vicinity of the Anus.

The patient has a frequent desire to go to stool, is at the same costive, and has sometimes a degree of strangury; there is a considerable pain in the vicinity of the Anus, which is much increased by walking, or any other kind of exercise. Upon examination we find the part red, swollen, and harder than common.

In a few days, there is an elevation where the swelling and redness were perceived, and also a fluctuation; and in a short time, the tumour bursts, and forms either a complete or incomplete Fistula.

When the Fistula is complete, the tumour, in some cases, subsides in a degree, when the fæces have been discharged, for the contents of the abscess pass through the fistulous canal into the Rectum. But the communication with the Rectum, is in other instances very narrow, and has an oblique direction, and can only be discovered by injecting water through the external orifice; or, upon introducing a flexible probe through the fistulous canal, which, by address, may be made to pass into the Rectum.

The abscess at the side of the Anus becomes daily larger, and gangrene sometimes takes place around the Anus, which proves fatal to the patient.

SECTION XVIII.

Of the Deposition of Albuminous Matter in the Cellular Coat of the Alimentary Canal.

The deposition of Albuminous matter in the Cellular Coat of the Alimentary Canal, though by no means an unfrequent organic disease, has hitherto attracted but little notice.

This organic derangement is of a very peculiar nature, and very generally affects at the same time different bowels of the Abdomen, and Pelvis, and also the Lymphatic Glands in the vicinity of these.

In the earlier part of the disease, we observe small hard tumours, about the size of a pea, in the Cellular substance, which grow inwardly, and which push before them the Villous Coat.

In the more advanced stages, the diseased bowel attains an unnatural hardness and size; and its coats are prodigiously thickened in some places. Tumours of a pyramidal figure grow inwards from the thickened parietes, by which the diameter of the affected part is much lessened. Upon making a section of the coats, we observe the Peritoneal Coat somewhat harder, whiter, and thicker than common, but no appearance of the Cellular or Muscular Coats, for their place is occupied by the Albuminous substance.

There is some variety as to the colour and quantity

of the Albuminous matter, which has been deposited; generally it bears a strong resemblance in colour and consistence to the white part of the skin of an orange, but it is not perfectly homogeneous as to its texture, being in some cases somewhat harder, and more transparent than in others; and I have seen it precisely of the colour and consistence of equal parts of bees-wax and tallow. Upon putting the Albuminous matter into an acid, or into alcohol, it becomes considerably harder.

The Villous Coat is also considerably thickened; and is somewhat like white leather that has been soaked in boiling water.

The neighbouring Lymphatic Glands are always considerably enlarged, of a white colour, and over their surface there is a plexus of blood-vessels filled by florid blood.

When this disease affects the Liver, Uterus, or Testes, these Glands attain an unnatural bulk; and upon the surface, and also within the substance, we meet with the albuminous matter deposited. When the albuminous substance is deposited within the substance of the Liver, Testes, or Lymphatic Glands, it completely destroys the healthy organization of these glands.

I received lately from Dr Barclay, an Uterus, which had been the prey of this disease; it was as large as the gravid Uterus at the full time, and its parietes were fully an inch thick.

It was lined by a layer of coagulable lymph, and

there were several irregular-shaped masses of a white colour within it, and of different sizes.

A suppuration sometimes, though very rarely, takes place in the very centre of this albuminous matter. The matter is not well-conditioned pus, but a thin sanious fluid, in which there are a number of irregularly-shaped white masses.

I have had various opportunities of examining this organic disease in the Liver, and have subjoined a short account of the appearances it assumes in that bowel.

This organic disease appears on the surface of the Liver in the form of small round Tumours, which in colour and consistence resemble pressed curd. The Liver does not retain its usual figure, it becomes much thicker at its edges.

The Tumours have a circumscribed margin, flattened apex, are of different sizes, and rarely are larger than a walnut. Such a diseased Liver sometimes weighs from 10 to 20 lbs. avoirdupoise. The increase in the size of the Liver is by no means equal to the increase of weight, as the Albuminous matter is much heavier than the substance of the sound Liver.

The Peritoneal Coat that covers those Tumours, is found to be of an unnatural thickness.

Tumours of a similar description, and of different sizes, are found throughout the substance of the Liver.

A thinner fluid, like the Coagulable Lymph of

the blood, is sometimes lodged in the centre of the albuminous Tumour.

These albuminous Tumours, when macerated in water, become soft and flabby; and when examined, even with the naked eye, appear in some cases perforated by a number of holes.

I never have been able to observe blood-vessels within the substance of such Tumours.

When albuminous matter has been deposited within a part of the substance of the Liver, I have generally remarked, that another part of the same Liver was of the consistence of jelly. Is it not probable, that that part of the Liver which had been reduced to a state of jelly, had undergone the same change as the other solids of the body before they are absorbed?

The substance of the Liver between the Tumours is of different shades of yellow or of green.

In this, as in most other species of enlarged Liver, the smaller biliary vessels within the substance of the Liver were enlarged, and the bile was of a darker colour, and thicker consistence than usual, which probably had been occasioned by the pressure of the enlarged Liver obstructing its exit from the Liver.

These Tumours within the substance of the Liver, have, in some cases, completely obstructed the biliary ducts.

In two cases of this kind, Dr DUNCAN, jun. was so obliging as to examine, by Chemical Analysis,

the contents of the Gall-bladder, and found that its contents possessed very different qualities from bile; for 3i. of it contained only four grains of matter, like the white of an egg, and so small a quantity of the yellow resinous matter, as to be imperceptible to the nicest balance. The Coats of the Gall-bladder were much thicker than usual, and were so much indurated, that the Gall-bladder, when empty, retained the same figure as when distended by bile.

May not the inspissated Mucus secreted by the Arteries, distributed on the Villous Coat of the Gall-bladder, form the external white crust, which is so frequently observed to cover those biliary Calculi which are passed by persons with a diseased Liver?

Of the Symptoms.

The deposition of a considerable quantity of Albumen in the Cellular substance between the Villous and Muscular Coats of the Alimentary Canal, obstructs the passage of the aliment, and gives rise to different symptoms, according to the seat of the disease.

When the Liver attains an unnatural size, it may, by an accurate observer, be detected much lower than usual, and at the same time, its surface may be perceived to be very irregular.

The patient suffers at the same time from indigestion, acidity, nausea, and pain at the top of the

shoulder, and is generally also afflicted by Jaundice and Ascites.

The Cellular substance of the Alimentary Canal is also thrown into a morbid state, from those diseases, which take their rise in the adjacent Coats, being communicated to it.

SECTION XIX.

Of the Organic derangements of the Muscular Coat of the Alimentary Canal.

The inflammation of the Muscular Coat of the Alimentary Canal is by no means so frequent as that of the Peritoneal or Villous Coats.

According to Bordeu, the Colica Pictonum sometimes occasions the inflammation of the Muscular Fibres; and I have seen the Rheumatism translated from the joints of the extremities to the Intestinal Canal.

Of Spasm and Palsy of the Muscular Coat of the Alimentary Canal.

Spasm and Palsy are much more frequent than the Inflammation of the Muscular Coat.

There is the greatest difference as to the sensibility of the Gullet in different individuals; some can swallow cold water, or brisk porter, more readily than others.

As in our erect posture, a greater effort is required in order to swallow solids than fluids, when the power of swallowing has been slightly impaired, fluids pass down, but not solids.

The muscular fibres of the Gullet, even though not inflamed, sometimes become much more irritable than common, especially in women of a debilitated constitution while they are nursing, and who have not a sufficient supply of milk for the child.

Hysterical women are also subject to a spasmodic constriction of the Gullet, to which the great distention of the Stomach by wind contributes; and even young women, in whom there is no Globus Hystericus, are subject to this kind of constriction when exposed to a stream of air; or I have seen the stricture of the Gullet suddenly come on during a thunder-storm.

This kind of obstruction, which is only temporary, goes off of itself, or yields to the Bougie, but is very apt to return.

But in other instances, the Gullet becomes less irritable than common, or paralytic, which also proves a cause of difficult deglutition.

Of Spasm of the Gullet.

Spasm of the Gullet is partial, or general.

When the Gullet has been partially constricted, the patient feels as if some extraneous body was lodged within it, accompanied with an ascent of air, which

is owing to the stricture preventing it from passing off by eructation; and when the spasm is seated in the lower part of the Gullet, the food is either retained for some time by the Spasm, and then reaches the Stomach, or it is rejected as soon as it arrives at the seat of the disease.

A Spasm of the Gullet sometimes comes on very suddenly, while the subject of the attack seems in good health; and its duration is various, for in some cases it lasts only a few hours, but sometimes for many days, weeks, or years.

I was acquainted with an elderly Gentleman, who was twice in the course of his life seized by a Spasm in his Gullet during dinner, and upon both occasions, he lost the power of swallowing suddenly, and when he seemed to be in good health.

The first attack of the disorder lasted only for a few hours, and was removed by an Anodyne Clyster, but the second was of three or four days duration.

This patient, for ten years, enjoyed perfect health, and died from inflammation of his lungs.

In some cases upon record, the Spasm was very readily removed, but in others, it proved obstinate.

Oysterdyck * mentions a case, in which such Spasms lasted for 12 days.

Mr Aird † has made mention of a case, in which

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* Vid. Bleuland, de sana et morbos Œsophag. structura, p. 56.

† Vid. Edinb. Med. Essays, Vol. I.

the Spasm of the Gullet continued through the whole course of a long life.

A very singular and very obstinate case of a similar description occurred in our Hospital in 1792, under the charge of Dr Rutherford, which has been already described in pages 102 and 103.

The patient lived for three years after recovering the power of swallowing, and enjoyed a tolerable share of health.

She died in consequence of inflammation in her Lungs.

The state of her Gullet was very accurately examined by Dr Rutherford, who found it perfectly sound.

To illustrate more fully the symptoms of Spasm of the Gullet, I have subjoined the history of a case of that description, which was attended by my Father, Drs Wardrop, Keith, and Mr G. Bell, and for which I am indebted to Dr Keith. In this case, the Stomach also was much diseased.

" October 10, 1810.—A. B. æt. 45, has laboured for about two years under occasional fits of dyspepsia, which he ascribes to his sedentary mode of life. For some months past, has had slight, though not constant difficulty in deglutition, and pain about the middle of the sternum, which only is felt after swallowing, or drawing a full inspiration, or in running, &c. 16th, During breakfast, observed, that on attempting to swallow bread along with his tea, it

stops in the Œsophagus for a few seconds, a rumbling noise, as if from the discharge of wind, is then heard, and immediately after the food passes into the Stomach. These effects are most perceptible at breakfast. 17th, A probang was introduced, but in its progress was stopped, when about half way down the Œsophagus; a large bougie was then passed, and a stricture felt distinctly. 19th, The probang was again introduced, and with some difficulty surmounted the stricture. The introduction produces slight pain, which soon goes off, but he still swallows with much difficulty. The probang passed till the 28th. It was then attempted to retain a circular probang, of half an inch diameter, in the stricture, but the great uneasiness it produced, immediately forced it out. Such a probang was passed with ease, several times beyond the Stricture, but a considerable resistance was felt in withdrawing it. The patient was not relieved till the 9th of November.

"Still complains of difficulty of breathing, on any slight exertion, and of constant pain about the sternum, stretching to the clavicles, which were much increased by a full inspiration. Soon after, being under the necessity of taking a short journey, during which he was exposed to cold, he was attacked by a slight Quincy on his return; this increased all his symptoms of dysphagia, and prevented the introduction of even the smallest instrument. During a few days, he used a

mucilaginous mixture, with opium, and the symptoms remitted, and the probang passed as before.

" The instrument was now only used once a fortnight. About the end of December, he was attacked with acute pain, tumefaction, and inflammation, in the superior part of the joint uniting the metatarsal bone with the first phalanx of the great toe of the right foot, for which he could assign no cause. By the use of leeches, saturnine applications, and blisters, the pain, swelling, and inflammation, were nearly removed by the middle of January.

" He had then a slight febrile attack, which lasted only two days, and left him in a better state of health than he had experienced for some months past.

" In about a week, he had a second similar attack, which also suddenly disappeared in the course of two days, but left him much debilitated. On the 10th of March, he vomited a considerable quantity of a dark-coloured Mucous fluid, which was very fœtid. This kind of fluid was occasionally rejected. About the beginning of April, his appetite almost entirely failed him; he was troubled with constant flatulence, and acidity in the Stomach. There was also considerable tension in the Epigastrium, and pressure here produced much pain and singultus, but at other times he felt no pain in the Stomach. To remove the oppression of the Stomach, he used to excite vomiting, by which a quantity of thin black mucous matter was difficultly brought up, with con-

siderable alleviation. If he excited vomiting immediately after eating or drinking, none of the food was ejected, but only the black coloured matter. At the beginning of May, his memory became greatly impaired; at which time, though much reduced, he was still able to sit up and walk about. He was also often troubled with acute pain in both elbows, or in the left shoulder; these came on suddenly, and were not removed until he became warm in bed. He continued in this way till he died, greatly emaciated, on the 26th of May. About a month previous to death, the probang was introduced, and passed nearly as easily as it did when first used.

"Dissection.—The cartilages of the ribs were ossified. The cavity of the Thorax contained about 1½lbs. of serous fluid. The lungs collapsed, were free from adhesions, and in other respects perfectly sound. The Pericardium contained a few ounces of a similar fluid. The Heart was free from disease. On opening the Abdomen, the Stomach appeared greatly distended, the right lobe of the Liver, from its superior edge, to a considerable extent downwards, was attached to that part of the Stomach lying under it by strong adhesions, so that it was impossible to separate the one from the other, without laceration of their substance. The Stomach being opened, was found to be filled with the same dark-coloured fluid that he vomited previous to death. The internal part of the Stomach, to the extent of more than a hand-breadth over which the liver ad-

hered, was in a state of fungous ulceration, with elevated and irregular edges. The contiguous parts were not inflamed, nor did the Coats in the other parts of the Stomach appear diseased. The Pylorus was contracted, and that part of the Stomach immediately above it enlarged in the form of a pouch. The orifice of the Cardia was perfectly free, nor could the least appearance *of stricture or disease be traced through the whole extent of the Œsophagus.* The small intestines were distended with flatus, and none of the matter found in the Stomach could be traced in them. The great arch of the Colon was contracted and filled with hard scybalæ. The Liver, except in its adhesions to the Stomach, was in a natural state. The Gall-bladder was flaccid—the Omentum was deprived of its fat—the Spleen, Pancreas, and Kidneys was perfectly sound."

Of Palsy of the Gullet.

In order to illustrate the effects of Palsy of the Gullet, I have subjoined the following cases of this rare organic affection *.

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* Richerand, Professeur de la Faculté de Médecine de Paris, Chirurgien en chef-adjt. de l'hôpital Saint-Louis, Chirurgien major de la Garde de Paris, &c. in his Nosographie Chir. has observed, Tom. III. p. 316, 2d edition. "Van Swieten, son disciple, rapporte un exemple de la paralysie de l'œsophage; cette mala-

Case I.—An Officer of the army, upon his return from the West Indies, where he had had the Yellow Fever twice in the course of one year, consulted me on account of a difficulty of swallowing. He was much reduced, had in part lost the power of deglutition, and had become so irritable, that the attempt to swallow, occasioned violent agitation, and sometimes Hysterical fits. Only a small part of what he endeavoured to swallow passed into his Stomach, the rest being immediately rejected through the mouth and nose.

A probang passed readily through the Gullet, but it gave him much uneasiness. Recourse was had to nutritious Clysters, and by these he was for some time supported. Electricity was also employed, and by means of it, he soon became capable of swallowing with considerable ease; and for some time could not swallow, unless while sitting upon the Electrical Stool.

By the continued use of Electricity during four months, and by means of regular exercise, and Cold Bathing, he got well.

Case II.—I had occasion to visit a Captain of a trading vessel, with a palsy of the Gullet, who, during the greater part of his life, had been exposed to many hardships; and to much cold, damp, and rainy weather. He also regained in a degree the

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die, extremement rare, puisque, jusqu'à present, ce fait est unique,"[22] &c.

power of swallowing by means of Electricity, and other stimulating remedies.

The following cases of Palsy of the Gullet were communicated to me by Dr Carmichael Smyth.

"Case I.—J. B. a country lad, 19 years of age, was, in the beginning of March (1786), seized with a shivering, and pain at the pit of the Stomach, which extended down the left side, and was accompanied by a slight degree of difficult breathing, although without any cough. About 14 days after this attack, he complained of palpitation at the region of the heart, which was most severe when he was in bed, or in a recumbent posture. His appetite was good, his body regular, and his sleep natural. Had always been subject to wind in his Stomach, though more so since his present indisposition. About a month after the commencement of the present symptoms, he perceived that he swallowed with difficulty meat, bread, or any solid food, although broth, milk, porridge, or other liquids, readily passed into the Stomach.

"About the middle of May, the difficulty in swallowing increasing, he took nothing but liquids, and lived chiefly on milk, to which a small quantity of rum was occasionally added. The pain at the pit of the Stomach continued only for three weeks, but all the other symptoms above described, viz. the difficulty of breathing, palpitation, and flatulence, owing to which, his Stomach at times was greatly

swelled, with a sense of heat in his throat, had gradually increased. He complained likewise of being occasionally chilly or hot, and of a constant perspiration, particularly on his hands and arms, and of a pain in his left side, with which he had been seized about a week before.

"He was ordered a cordial and volatile mixture, and volatile liniment to be applied externally to his throat.

"On the morning of the following day, he swallowed some milk porridge, and gruel; that evening he had a blister put upon his back, and on Wednesday, he ate some meat and bread.

"He was ordered, two days afterwards, five grains of the pil. ex myrrh. compos. Phar. Lond. every night at bed-time, and he had a caustic put on his left side, which entirely removed the pain, and relieved the breath.

"In a few days, he completely recovered."

Case II.—"James Bull, a soldier, aged 32, applied for admission into the Middlesex Hospital, on Thursday the 11th January 1784. He gave the following account of his complaints.

"That on Sunday preceding, he went to bed in his usual health; that about three o'clock in the morning he awoke, and being thirsty, got out of bed to drink some water, which was in the room, but to his great surprise, found he could not swallow it; he then tried to swallow some milk and water, but

with no better success. He said, that excepting having lost the power of swallowing, he was in other respects in perfect health, and felt no other inconvenience but faintness and hunger, excepting when he attempted to swallow; and that upon doing this, he was in danger of suffocation, the liquor being forced back immediately through his nose and mouth. This I found to be strictly true, as I made him try to swallow a little milk in my presence.

"Upon examining the fauces, there was no preternatural appearance, only that the Velum pendulum Palati, Tonsils, and posterior part of the Pharynx, seemed uncommonly pale and flaccid.

"The probang passed readily into the Stomach, a proof that there was no mechanical obstruction or stricture in the Gullet.

"He had a clamminess in his mouth, a hawking and spitting of the Phlegm. Upon the whole, it was apparent that the patient's complaint was a Palsy of the Gullet, and this was still farther confirmed, by remarking, upon a closer inspection, that his mouth was drawn a little to the left side. He was ordered to have a broth clyster immediately, and likewise his throat to be fomented by warm spiritous fomentations, and afterwards a large sinapism to be applied. In about two hours, he was able to swallow broth. The day following had an emetic, and with the use of warm and stimulating medicines, was in the course of the week discharged from the hospital cured."

Case III.—" Mr K——, a man between 50 and 60 years of age, of a sallow complexion, of a tall stature, and of a spare but muscular habit, had suffered for some time from Stomach complaints. He had also some slight paralytic attacks in the face and arm. He suddenly lost the power of swallowing even liquids. The probang passed with ease into the Stomach; and it was remarked, that immediately after using it, he could swallow a very little milk, or any other mild liquor, although wine and porter caused coughing, and a risk of suffocation. He was supported for 10 days or a fortnight by clysters and beef-tea, or milk poured into the Stomach by means of a tube or canula made of the elastic gum. After some time, he gradually recovered."

Palsy of the Gullet is also a symptom of some diseases; as of Hysteria, of the last stages of fever, and of Phthisis Pulmonalis. In such cases, a small quantity of any fluid does not give the necessary stimulus; hence a large spoonful of a fluid gets down, though the patient be incapable of swallowing a smaller quantity.

Of the Concomitant Symptoms.

The sudden loss of the power of swallowing, the dryness, parched appearance, and sense of constriction in the fauces; the immediate rejection of what is attempted to be swallowed, and the difficulty or

impossibility of passing a whalebone probe through the Gullet, characterize a spasm of the Gullet, with which general agitation of the body is frequently combined, and a change in the sound of the voice.

But in some cases of Spasm of the Gullet, as Dr Percival has observed, "liquids sipped slowly, and swallowed leisurely, meet with no resistance; but when hastily drunk, or in too large quantity, they are quickly regurgitated."

Warm liquors are swallowed with more ease than cold ones*.

The probang may readily be passed into the Stomach in cases of Palsy of the Gullet, for the stimulus excited by passing it, instead of aggravating the disease, as in cases of Spasm, sometimes has enabled the patient to swallow†.

It seems singular, that in the Palsy of the whole Gullet, the greater part of any liquid which the patient endeavours to swallow, should be immediately rejected by the Mouth and Nose; proving that the Muscular fibres of the Gullet, though incapable of propelling the food downwards into the Stomach, are not unsusceptible of the stimulus of distention, and still may be roused to an inverted action.

But when liquids pass down a certain way, and are then forced up, the paralysis probably occupies only a part of the Gullet. I have described in my The-

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* Vid. Med. Trans. of London, Vol. II. p. 91.

† Vid. Case in p. 234.

ses de Dysphagia, such a case of Palsy of the Gullet. "Ægram nuper vidi, quæ inter fluida etiam sorbendum, guttur sibi interclusum, tussimque vehementissimam excitatam, sensit."

A Palsy of the Gullet sometimes accompanies, or is followed by Palsy of other parts of the body.

Of the Spasmodic Contraction of the Stomach and Intestines.

Spasm sometimes pervades the whole Stomach *, or it is limited to its apertures.

The Spasmodic contraction of a part of the Intestinal Canal, is one of the most common morbid appearances, especially in the bodies of children; and the constricted part sometimes passes within another portion of the Intestinal Canal, producing a kind of Intus-susceptio. But as the constricted portion is not retained in its unnatural situation by the effects of inflammation, it may readily be disengaged.

The stricture at the Cardia is sometimes the effect of air contained within the Stomach, as sometimes takes place in Hysteria, Dyspepsia, &c.

I visited a lady who suffered from great distention in her Stomach and Intestines from eating a few slices of cucumber.

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* Ruysch has published a case, in which the Stomach was much contracted from abstinence. Vid. also Lieutaud, Hist. Anat. Med. p. 10 and 11, Vol. I.

Baron Haller relates the history of a case of a person who lost his life from inflation of the Stomach, the effect of eating melon.

My Father was consulted by a gentleman, who suffered the most excruciating torture in his bowels and stomach, from distention, occasioned by his having eaten a large quantity of nuts. The most acrid purgatives were given in vain; at length a stool was procured by the smoke of tobacco. *

The symptoms of inordinate distention of the Stomach are, acute pain in the Stomach, difficulty in breathing, weak pulse, palpitation, and sometimes inflammation. These symptoms are sometimes followed by sudden death, and rupture of the Stomach.

The Spasmodic stricture of the Pylorus is often induced by the irritation of acrimonies of different kinds, and even by food of difficult digestion.

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* Vid. Portal, Anat. Med. Tom. V. p. 183.

Ruysch has informed us, that in the case of a person who had a very voracious appetite, he had observed the Pylorus very much relaxed, and wider than usual, and seems to have imputed the voracious appetite to that cause.

I had occasion, last June, to see a patient at the Dispensary, who had had a very voracious appetite. My assistant at the Dispensary, Mr Smith, was at great pains to discover every circumstance respecting the history of the patient, and informed me, that our patient's head was at birth unusually large, and that her back-bone became deformed when nine months old, after a severe fever, her breathing became difficult, and her legs paraly-

A case has been published* which affords a strong illustration of the preceding remark, in which a great degree of colic was induced by drinking new bottled oat ale and wine. The patient died in a short time.

Upon dissection, "the Ileon measured four inches in diameter, and the Colon eight inches; and a portion of the Colon, and the greater part of the Omentum, were forced through the Diaphragm."

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tic, and she did not menstruate at the usual period. When about 18 years of age, she suddenly became giddy, was seized with nausea and vomiting, and fluttering at her heart. She was somewhat relieved by vomiting. She had frequently such attacks. Body in general regular, though sometimes she had Bilious Diarrhœa. Her urine, which was always voided with difficulty, was occasionally white and thick. Her appetite *became then inordinate*. Her usual food was oatmeal porridge, and of this, the mother says, she used to take about *six English pints per day*, and about a bottle of porter; but from what her neighbours stated, and a seeming disposition on her part to conceal the quantity, I am apt to suspect that the mother's account *is rather under the truth*. She generally rejected a part of her food: as soon as the vomiting ceased, her desire for food returned so violently, that she was unable to resist it. A spasmodic affection of the Pharynx often prevented the food from reaching the Stomach; she was then tortured by the most intolerable hunger. The Catamenia became very profuse, and continued for a week, and were succeeded by Leucorrhœa. Pulse about 80. Had a disposition to sleep. Her appetite became still more voracious. The Cata-

* Vid. London Phil. Trans. abridged, Vol. IV. Part II. p. 80.

The eating wet clover frequently produces great distention of the Stomach in sheep and oxen.

A contraction in the middle of the Stomach has been considered by some authors as the natural form of that organ.

Five cases of contraction in the middle of the Stomach have been enumerated by Morgagni*, of

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menia ceased about eight months before she died, which seemed to have been occasioned by apoplexy.

I was present at the dissection of the body; the Dura mater was of a dark purple colour, and the Pia mater and Arachnoid Coat were much thickened, and adhered to each other very firmly; and the Medullary substance of the Brain was of the colour of Liver.

The Stomach and Intestines were examined with the most scrupulous attention, *and were found to be in every respect in a healthy condition.*

* The first case is mentioned in Lit. XVI. art. 38. The patient, a young woman, was pregnant, and died with symptoms of slight fever. The body was opened half an hour after death. "Ventriculus (he observes) in medio ferme suæ longitudinis contrahebatur, utrinque exuberans," &c.

The subject of the second case, mentioned in Lit. XXVI. art. 31, was 42 years of age, and had been subject to difficult breathing, occasional uneasiness, and numbness of the left side. The body was examined the day after the patient died. The Stomach is described "quasi duplex."

The third case of this description is recorded in Lit. XXX. art. 7. The patient had long been subject to vomiting in the morning, and after dinner. The body was examined on the evening of the day she died.

The fourth case is mentioned in Lit. XXXVI. art. 3; in this

which there is a brief extract in the subjoined note. Blasius*, Lorry†, Dr Walter of Berlin‡, Hufeland§, and Van der Kolk‖, have also described the contraction in the middle of the Stomach.

This contraction in the middle of the Stomach is either temporary or permanent, and according to Morgagni¶, is connected with a derangement in the functions of digestion.

But a contraction in the middle of the Stomach is not always to be found; and Mr E. Home is perfectly correct in stating, "that a contraction in a greater or lesser degree is *very generally* met with**."

This contraction of the middle of the Stomach is

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case also, there was frequent vomiting before death. "Ventriculus in medio angustus, ut ibi Pylori arctitudinem æquaret, sicque duos quodammodo representaret Ventriculos."

The fifth case is mentioned in Lit. XXXVIII. art. 28, and the patient's death was imputed to a violent blow on the head, which she had received a few days before her death.

* Vid. Lieutaud, Hist. Anat. Med. Vol. I. p. 12.

† Vid. Hist. de la Societ. Roy. de Med. Tom. XI. p. 195.

‡ Vid. Catal. No. 1572.

§ Vid. Journal der pract. Arzneyk, V. B. P. 823.

‖ Vid. Dissert. Groning. 1793.

¶ "Quo si tibi liceat addere structuram illam ventriculi minus fortasse idoneam ad alimenta, si non conficienda, at satis expedite in id intestinum compellenda; tanto erit proclivius causas intelligere vomitus istius tam diuturni."—Vid. Epist. XXX. art. 8.

** Vid. London Phil. Trans. for 1807, Part II. p. 171.

most obvious in those instances where the Stomach is of unusual size, and where the distance between the opposite extremities is greater than common.

Mr E. Home has described a case, in which he has observed, that "the contraction was so permanent, that after the Stomach had been kept in water for several days in an inverted state, and at different times distended with air, the appearance was not altogether destroyed *."

In a subsequent paragraph, he has added, "If the body is examined so late as 24 hours after death; this appearance (viz. the contraction in the middle of the Stomach) is rarely met with."

But there is a species of contraction of the middle of the Stomach which does not go off, of which I have a specimen before me† while writing these lines, and where the contraction is at present quite obvious, though the Stomach has been preserved for eighteen months in spirits. The body of the patient was examined 36 hours after death, and the Stomach has been more equally divided into the Cardiac and Pyloric portions, than in the plate which has been published by Mr Home; and the contraction is also much greater, and seemed as if it had been occasioned by a cord being tied very slightly around the Stomach.

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* Vid. London Phil. Trans. for 1807, Part II.

† Which was sent to me by Mr A. Burns of Glasgow.

The Muscular fibres in the Pyloric portion are very manifest; indeed they are much more manifest than in any human Stomach I have examined. In this case, there had been no previous derangement of the functions of the Stomach.

The Muscular fibres were also obvious, though of a much smaller size than those of the Pyloric portion, upon that part of the Cardiac portion which is next to the Pyloric part, and a few Muscular fibres passed from the Gullet upon the Cardiac part of the Stomach.

The preparation before me affords also an additional illustration of the accuracy of Mr Home's conclusions, respecting the uses of the Cardiac and Pyloric portions of the Stomach, and which in justice to my ingenious colleague, Dr Rutherford, it may be proper to observe, had occurred to him, and which he communicated to me before reading Mr Home's paper, which I put into his hands.

The above case also affords a strong proof (if we adopt the sentiments of Mr Home, who supposes that the food is dissolved in the Cardiac portion of the human Stomach), of the gastric juice being the principal agent in digestion, and also a strong argument against that theory of digestion, which supposes digestion to be the result of the mechanical operation of trituration.

Söemmering * has described a stricture near to

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* Vid. Vol. VI. of his Anatomy of the Human Body, p. 212.

the Pylorus, as the natural form of the Stomach, which I have also observed.

In some cases, the Stomach has been contracted in several places, and resembles the Colon. De Haen, speaking of a case of this description, has observed, " nihil habuit Ventriculi figuræ simile, sed canalis mire tortuosi, intestini instar*."

Of Palsy of the Stomach.

Debility of the Muscular fibres of the Stomach is very frequent, but it very rarely amounts to such a pitch, that vomiting cannot be excited.

Lieutaud † has, however, described the case of a man of 60, who had laboured under a continual sense of fulness, weight of the Stomach, accompanied by nausea, and inability to vomit.

Upon dissection, the Stomach was found very much distended, though the Pylorus was not obstructed; hence Lieutaud concluded that the Stomach was paralytic.

Of Spasmodic Contraction of the Intestinal Canal.

A Spasmodic contraction of the Intestinal Canal

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* Vid. Ratio Med. edit. Leid. Vol. III. p. 6.

† Vid. Mem. de l'Acad. R. des Scien. Ann. 1756.

sometimes takes place, and gives rise to Colic, which is excited by a great variety of causes.

Various species of Colic have been enumerated by authors: the Colica Stercorea, Flatulenta, Pictonum, Spastica, Biliosa, Accidentalis, Phlogistica, Scirrhosa, Herniosa, Dysenterica, Calculosa, Verminosa, Hæmorrhoidalis, Arthritica, Scorbutica, Nephritica, and Hepatica.

Much pains has been taken to distinguish these very different kinds of Colic, and also the place of the contraction of the Intestines.

The Colica Stercorea is said to be distinguished by the sense of weight, and fulness in the bowels, and by the constipation which has preceded it.

The Colica Flatulenta, by the Intestines being much stretched by air, by their elastic feeling, by the rumbling, which the air passing from one part of the Intestines to another creates; by the pain in the belly changing its place, and by the relief which the discharging the air upwards or downwards gives, and by the constipation; and this species of Colic has sometimes been said to be the cause of the umbilical Hernia.

The Bilious Colic has been supposed to be distinguished by the acute pain it creates, though the abdomen be not tense, by the bitter taste in the mouth, bilious vomiting, by its exacerbations and remissions, by the pulse being somewhat accelerated, and by its tendency to pass into Cholera, or Inflammation of the Intestines.

The symptomatic Colic is distinguished from the idiopathic by the previous history of the case.

It has been supposed to be possible, from the symptoms, to discover the seat of the unnatural contraction of the Intestines; thus, pain in the navel has been supposed to be characteristic of contraction in the Jejunum or Ilium; nervous oppression, torpor, inclination to sleep when the Stomach is empty; occasional distention of the Abdomen, pain in the right side, which is occasionally very great, and which stretches to the back, and occasionally to the top of the right shoulder, and which changes its place upon the expulsion of air, slight yellowness of the eyes and countenance, with an irregular and soft pulse, that of the Duodenum: and pain in the right side, stretching upwards to the region of the Liver, that of the Caput cæcum Coli.

Sauvages * has made what appears to me a very just observation respecting the diagnosis of the different kinds of Colic. "Cum Intestinum tenue et crassum diversas sedes occupet, et diversis visceribus abdominis contiguum sit, difficile est ex sensu ægrotantis partem affectam determinare, et errare in hoc assignando, quotidianum est;" beside, though the seat of the constriction could be ascertained, that circumstance does not alter the method of treatment.

A languid, dejected, or maniacal expression of

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* Vid. Nosol. Method. Vol. II. p. 99, quarto edit.

countenance, is very characteristic of the Colica Pictonum.

There is also giddiness, dimness of sight, loathing of food, pain at the pit of the Stomach, occasional nausea, and bilious vomiting, costiveness, and severe Colic.

The patient becomes more costive, as the sickness, bilious vomiting, and pain in the bowels increase.

Upon the vomiting ceasing, the pain abates, and hiccough comes on; but the pain soon returns, and often extends to the region of the navel, to the back, and loins, and even to the legs, the muscles of which are in some cases painful on pressure. The pathognomonic symptoms of the Painter's Colic are, the acute twisting pain about the navel, which is not increased on pressure, the dragging inwards of the parietes of the abdomen, which, when pressed, feel hard or knotty, tenesmus, and obstinate costiveness.

The Sphincter Muscles of the Bladder and Anus are in some cases much contracted, and prevent the discharge of the fæces, the introduction of a clyster pipe, and also occasion difficulty in passing the urine.

The above symptoms are generally of several days duration. Towards the conclusion of the disease, the patient suffers from griping, has a disposition to go to stool, and discharges a quantity of fæces in the form of hard balls, like sheeps dung, mixed with a viscid mucus, or blood.

If the patient be exposed to cold, or gets his shoes wetted, or is inattentive to his diet, the Colic returns.

When this disorder has been neglected, or improperly treated, it lasts for several months; in some instances for years; and terminates in a Palsy of the upper extremities, in weakness, or loss of voice, in amaurosis, deafness, or epilepsy.

In this chronic form of the disease, the patient has only short intervals of ease.

The palsied arm or leg shrinks very much; the muscles lose not only their natural size*, but also their natural structure, and have been converted into a suety substance †.

Upon dissection, the Intestines are found to be alternately contracted and dilated.

The Colica Pictonum proves in some cases a more acute disorder; the tenesmus and pain in the belly being speedily succeeded by quickness of the pulse, heat in the skin, acute headache, hiccough, retching, bilious vomiting, delirium and apoplexy; and in a very few cases, this disease leads to inflammation and gangrene of the Intestinal Canal.

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* According to De Haen, the Deltoid Muscle was in one case converted into a membrane.

† This very remarkable change which the Muscular flesh undergoes, is not peculiar to this disease. I have observed it in some cases of Scrofula and Rickets, and also in the disease, called Osteosarcoma, and it has also been remarked by Dr Camper in cattle.

SECTION XX.

Of the Organic Derangements of the Peritoneal Coat.

The Peritoneal Coat of the Alimentary Canal being a serous membrane, partakes of the organic derangements which are peculiar to membranes of that description.

Of the Inflammation of the Peritoneal Coat of the Alimentary Canal.

Upon dissection, we meet with partial or general inflammation of the Intestines, and which has united them together into a mass, so that it is difficult, by dissection, to disunite the one turn of Intestine from the other. These appearances are also observed in women, who have died from Puerperal Fever.

The coagulable lymph which has been effused, sometimes assumes the form of detached white shreds, but in other instances, it forms a layer of considerable thickness over the Intestines; and in a few cases, the coagulable lymph, like a riband, encircles a portion of Intestine, and impedes the progress of the contents of the Intestines, occasioning the symptoms of strangulation.

When the Peritoneum has been inflamed, it loses its healthy colour and elasticity, is covered by a plexus of blood-vessels, which are filled by florid red blood, and when the inflammation has been very acute, it is of a purple colour, owing to extravasated blood, and to the veins being also full of blood.

But, as was formerly observed, a red colour is not essential to inflammation; for I have seen the Intestine of a sea-green colour, when the smaller arteries were gorged with red blood, and when, at the same time, there were patches of coagulable lymph on the surface of the Intestines.

The Peritoneal Coat from inflammation sometimes acquires an unnatural hardness and thickness.

Serous Membranes in the healthy state do not possess much sensibility, as has been frequently remarked, and distinctly proved by my Father.

In three different cases, in which the chest was punctured, he crooked a probe, introduced it within the chest, and rubbed the point of it against the Pleura, and the patients *did not experience pain.* And in another case, he introduced a long Bougie into the chest, and on turning it round, the patient felt something moving, but *did not suffer pain.* He also repeated the experiments of HALLER upon pigs; cutting away the Intercostal muscles, pricked, and even tore the Pleura, but the animals did not seem to suffer from it.

It is also remarkable, as Dr C. SMYTH has observed in his paper on the different kinds of inflamma-

tion, " that though not very sensible to the usual stimuli, they (Serous Membranes) are affected in a singular manner by the air; a stimulus which has little or no operation on other parts of the body endowed with the highest sensibility *."

Serous Membranes, when under the influence of inflammation, become exquisitely sensible; and it is not a little remarkable, that Baron HALLER, who was no less distinguished for his diligence and industry, than for the natural faculties of his mind, and who also had devoted much attention to Pathology, should have entertained a different opinion, and should have endeavoured to prove that the Intercostal Muscles are the seat of Pleurisy; an opinion which is contradicted by all the phenomena of the disease, and by the dissection of those who have fallen victims to it.

In cases of Inflammation of the Peritoneal Coat of the Alimentary Canal, the cavity of the Abdomen generally contains more or less of a turbid serum: through which small pieces of coagulable lymph pass in different directions.

There is little difference as to the morbid appearances in the acute and the chronic inflammation of the Peritoneal Coat of the Stomach and Intestines.

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* Vid. London Med. Communications, Vol. II. p. 200.

Of the Concomitant Symptoms.

The symptoms of the acute inflammation are well defined.

The patient's countenance is expressive of much anxiety; he is costive, but does not at first suffer from such acute pain in the belly, as causes much alarm. But the disease in other instances is much more rapid in its progress, and is attended by acute fever, and creates very acute pain in the belly, especially in the region of the Navel, which is much increased by pressure, and by moving the trunk of the body, and the pulse is quick, hard, and thready. There is also considerable fulness and tension of the belly, which is accompanied by vomiting and sickness.

After the disease has lasted for a day or two, the tongue is covered by a firm fur, and delirium, convulsions, and death in some cases, speedily follow.

When the inflammation has extended to the Stomach, to the Liver, Diaphragm, and Lungs, the patient becomes breathless, and cannot lie down in bed* on account of the acute pain in the belly he suffers.

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* The above symptom I have inserted on the authority of Dr SANDERS, who informed me, that he had lately remarked this very remarkable symptom, in the case of an old gentleman, whose

The inflammation sometimes spreads to the Muscular Coat; in these circumstances, there is a sudden aggravation of all the symptoms; and from the spasmodic contraction, the pain is at one time much more acute than at another.

The chronic inflammation of the Peritoneal Coat of the Alimentary Canal is slow and insidious in its progress; and is characterized by the following symptoms:

At the commencement of the disease, the pulse is somewhat accelerated, and there is a slight pricking pain perceived by the patient in the region of the navel, which is somewhat increased on pressure.

The patient also labours under the symptoms of slight indigestion; the tongue is furred; the appetite is much impaired; the patient is languid, and incapable of even the slightest exertion; and there is a soreness, thickness, and pricking across the region of the belly.

The functions of the Intestines are much impaired, the patient becomes costive, and the bowels are easily moved, which affords much relief.

The chronic inflammation of the Alimentary Canal is, from some accidental circumstance, very apt to be converted into the acute form of the disease.

Lungs, Diaphragm, Liver, Stomach, and Intestines had formed one continued mass, in consequence of inflammation.

SECTION XXI.

Of Small Tumours growing from the Peritoneal Coat.

Small Tumours sometimes have been found to grow from the Peritoneal Coat of the Intestines, or Mesentery of children, who have died from Hydrocephalus internus, or Phthisis pulmonalis, Ascites, or Anasarca.

These Tumours are of different sizes, of a pale grey colour, generally of an oblong or pyramidal figure, and to the touch soft, and sometimes compressible.

Dr Baillie has described "white soft granulated matter," which I suppose to be similar to the above swelling, behind the Peritoneum; yet, he says, "at the same time adhering to it." "The matter, (he observes,) appeared to be scrofulous, for it resembled exactly the structure of a scrofulous absorbent gland before pus is actually formed*."

I am not acquainted with any peculiar symptoms which are characteristic of the formation of these Tumours in the living body.

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* Vid. Morbid Anatomy, 2d edit. p. 129.

SECTION XXII.

Of Ossification of the Peritoneum.

Ossification is frequently observed in the Serous Membranes. I have seen the Ossification of the Dura Mater and its processes, of the Pia Mater, of the Sclerotic Coat of the Eye, of the Capsule of the Crystalline Lens, of the Pleura, Pericardium, of the external covering of the heart, of the Valves of the heart and arteries, of the Internal Coat of the Arteries and Veins, of the Lymphatic Vessels, and Lymphatic Glands, of the Peritoneum, of the Vaginal Coat of the Testicle, of the elastic Ligamentous sheath of the Penis, of the Capsular, and also of the Interarticular Ligaments, and of the Membrane covering the Placenta, and even of the arteries of the Placenta.

The process of ossification sometimes takes place on the coats of Hydatids, which are generally connected with serous membranes; and Dr Baillie has remarked * that preternatural adhesions formed in consequence of inflammation, and which connect in some instances the convolutions of the Intestines, have sometimes been converted into bone.

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* Vid. Morbid Anatomy, 2d edition, p. 193.

It is entirely foreign to the subject of this book, to enter into any enumeration, or examination of the various opinions, which have been published respecting those causes which dispose to the deposition of bone. I shall, therefore, only observe, that in many of the above cases, in which bone has been deposited upon Serous Membranes, there had previously existed a greater or lesser degree of the inflammatory action.

I am not acquainted with the pathognomonic symptoms of Ossification of the Peritoneal Coat of the Alimentary Canal.

SECTION XXIII.

Of Hydatids.

By the term Hydatid, is to be understood, a round or oval-shaped semi-opaque pulpy bag, possessing a contractile power, without an external opening, of a pearly or yellowish colour, containing a watery fluid, and often a number of smaller Hydatids, and included within its proper Capsule or Cyst.

Hydatids are of very different sizes; some are not larger than a millet-seed, others are equal in bulk to an ox's bladder.

The Coats of Hydatids are generally thin and semitransparent, although sometimes so thick as to be perfectly opaque.

The Habitat (to make use of the expression of

modern Naturalists) of Hydatids is also different. They have been discharged by vomiting, and by stool*; frequently they are attached to the Peritonæum, and especially to that part of it which covers the Liver, or they are imbedded in that organ, or attached to the Kidneys or Ovaria, or to some part of the Alimentary Canal.

Hydatids have also, though more rarely, been found in the Cellular Membrane, likewise between the Muscles, and sometimes, though still more rarely, within the Bones.

There formerly existed a great variety of opinion respecting the nature of Hydatids.

Naturalists now seem to agree, that they belong to the animal kingdom, and constitute a Genus of animals, of which there are several species; but sufficient observations on recent or living Hydatids, have not yet been made, to enable us to draw up generic or specific characters†.

Hydatids, like Intestinal Worms, are incapable of independent existence, and therefore, exhibit a contractile power only when examined immediately upon being discharged from a living animal. The remaining for many hours within the dead body, generally deprives them of the principle of life; and

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* Vid. Philosoph. Trans. Vol. XXII.

† The generic name of *Hydria* has been proposed, but no character of the genus has been established. It seems not improbable, that the Hydatids of the human body must form a separate genus, distinct from the Hydatids of sheep.

hence all specimens of Hydatids are not observed to contract, and such as retain the power of contraction for some time after being expelled, may be considered as unusually tenacious of life.

Purulent matter, which is sometimes lodged within the same Viscus, also proves fatal to Hydatids; and in this case, of course, they show no contractile power.

The Hydatids found in human bodies, are different from those of quadrupeds.

Of the human Hydatids, there are the following kinds.

1st, Where there is only one large Hydatid of a globular form, contained within a Cyst*.

2d, Where there are several Hydatids within the same Cyst, of different sizes and colours, some being of a pearly, and others of a straw or amber colour†; and some of the larger of these are found to contain others.

A 3d kind of Hydatid has been also described, but which I have never yet seen, where a number

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* Vid. Case VII., in which eight English pints of fluid were contained within a large Hydatid; there were no small Hydatids within it, and the whole of the inner surface of the Hydatid was perfectly smooth.

† Vid. Case IV. The Cyst of the Hydatid contained four pints of water, and a great many Hydatids of different sizes; some were about the size of a nutmeg, others, as large as a billiard-ball, floated loose within the largest Hydatid; and within several of the larger Hydatids, there were clusters of small spherical bodies grouped together, which adhered to their inner sides.

of Hydatids have been inclosed one within another, like a nest of chip-boxes.

The 4th kind may be called the Cellular Hydatid as it is peculiar to the Cellular substance of the Muscles: The Cyst of this kind is of considerable thickness, and consists of several distinct layers, which sometimes acquire a Cartilaginous hardness.

There is a 5th kind of Hydatids, which, from being compressed together, and forming a substance about the size of a garden pea, has been mistaken for indurated lymphatic glands. This kind has not, as far as I know, been described. The Hydatids are firmly united to each other by a very adhesive Mucus, and by a thin membrane, besides which, each of them is enveloped by its own proper capsule. These Hydatids are very small, being about the size of the Ovula in the Ovaria of fishes*.

This kind is often found in the Choroid Plexus of the lateral Ventricles of the Brain, in cases of Apoplexy and Hydrocephalus.

There is a 6th, though very rare sort of Hydatid, which also, so far as I know, has not been described. In this, the Hydatids are united laterally to each other†. I have met with only two examples of this variety of Hydatids, and in both, they were connected with the Liver. There were, at the same time, a great number of Hydatids of different sizes

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* Vid. Plate I. fig. 2. † Vid. Plate II.

attached to the Peritonæum, and floating about in the general cavity of the Abdomen. One of the patients, a boy, was supposed to labour under Ascites, his belly being enormously swollen, his breathing much oppressed, and he was not relieved by an erect posture. The superficial veins of the Abdomen were greatly enlarged. For about nine months before his death, he had severe pain in the right Hypochondrium, and a considerable partial Tumour was observed in his belly, which increased with great rapidity for ten days before his death. Upon dissection, about 4lbs. of a fluid like tar ran out of the Abdomen. A large Hydatid was found adhering to the convex part of the Liver; and six others were found adhering to this. The Stomach was much displaced, the Pylorus being as low down as the brim of the Pelvis, and the greater share of the Intestinal Canal lodged within its cavity.

The watery fluid* contained in Hydatids, is generally transparent and colourless, is to the taste slightly salt, and in some instances, a part of it is coagulated by heat, or by the addition of acids, or ardent spirits.

In some cases, the contents of the Cyst are tinged with yellow, which is probably owing to an admix-

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* According to Dr JOHN HUNTER, this fluid contains very small Hydatids, of different sizes, the largest being $\frac{1}{100}$ part of an inch in diameter, and the smallest being less than a red globule of the blood. Vid. Trans. for the Improvement of Medical and Chirurgical Knowledge, Vol. I. p. 38.

ture of bile, exuding after death; for the yellow colour is observed only in Hydatids which are connected with the Liver and Gall-bladder.

There are also Tumours, the contents of which seem to be Coagulable Lymph, and a number of Hydatids which have burst, and the coats of these are shrunk and inverted.

There is a 7th kind of Hydatids, with narrow necks, which is frequently attached to the Placenta. I have also seen Hydatids of the 2d species, connected with the Placenta.

Some of the bowels, as the Ovaria and Kidneys, are said at times to have been converted into Hydatids, but it would be more accurate to speak of the conversion of these bowels into watery vesicles; (the genuine Hydatid being rarely found within these bowels;) and these Vesicles have only one Coat, they are not inclosed within firm Cysts, and do not produce their like, nor do they possess any degree of contractile power like the genuine Hydatid.

Of the Sac of Hydatids.

The Sac of the Hydatid, seems to be formed of condensed Cellular substance, and the thickness of the Sac generally bears a ratio to its size and situation.

This Sac is secured in its place by several bands of Cellular substance, which pass between it and the

bowel within which it is lodged, and in the Abdomen, it is covered by the Peritonæum.

The thickness of the Sac of a Hydatid is in proportion to its size; although there is a considerable difference in this particular, the Sac being thickest where it is most exposed: thus when the greater part of the Sac is surrounded by the substance of a bowel, as of the Liver for instance, that part only of the Sac which is exposed, is of a considerable thickness, and is sometimes cartilaginous, or covered by layers of bone.

I have observed, that the inner surface of the Sac is by no means uniform, but always somewhat irregular, and lined by a very thin layer of fat.

A glairy gelatinous liquor is also interposed between the Sac and the Hydatid, which prevents the Hydatids from being injured by friction.

The Sac of a large Hydatid is sometimes divided into compartments, which serve to prevent the smaller Hydatids, contained within the opposite ends of the Sac, from pressing upon each other.

Of the Coats of Hydatids.

The Coats of the Hydatid are not of an uniform density, being much thicker in some than in others; and even in the same Hydatid, we generally observe some portions of these Coats of greater density than others; so that in the same Hydatid, there is a difference as to transparency or opacity in the different parts of its Coats.

Hydatids have two Coats, an outer and inner, and the outer Coat is considerably thicker than the inner.

There are no fibres in the outer Coat of a Hydatid visible to the naked eye; yet the outer Coat possesses the distinguishing character of a Muscle, the power of contraction upon the application of a stimulus.

The inner Coat of the Hydatid is very thin, semi-transparent, soft, pulpy, and very tender, and in very large Hydatids, possesses a small share of elasticity. The interior surface is lubricated by a fluid, which renders it slippery to the touch.

From the inner side of some of the larger Hydatids, there are several excrescences, which are made up of a congeries of very small Hydatids, and the size of these bears a ratio to the size of the Hydatid.

These excrescences are retained in their situation by a very thin transparent membrane, which covers them.

There is still another appearance which I have remarked, viz. a number of small cells formed by folds of the inner membrane of the large pregnant Hydatid, containing the small ones.

It has not yet been determined, what is the proportion of Hydatids which may be called pregnant.

In some cases, the greater part of the inner Coat is studded over with these small excrescences, but in other instances, there are only two or three such excrescences from the parent Hydatid.

Upon examining the Coats of very large Hydatids even without the aid of a magnifying glass, very small Hydatids may be seen adhering to the Coats of the Hydatid*, which would seem to show, that Hydatids are multiplied in the same manner as some of the Fungi of the Vegetable Kingdom.

Blood-Vessels of Hydatids.

The Coats of Hydatids are provided with very small blood-vessels, absorbents, and nerves.

The blood-vessels proper to the Coats of the Hydatid, have no immediate connection with those of the organ within which it is lodged: the Hydatid, in this respect, resembles a worm lodged within the human body.

I have, in several instances, filled, with great success, the blood-vessels of the organ within which Hydatids were lodged; also those upon the Sac of the Hydatid; which, where the Hydatid is of considerable bulk, are of a large size, and which, like those in the neighbourhood of other preternatural tumours, acquire an unusual size, but none of the injection got into the vessels of the Coats of the Hydatid.

But other authors have affirmed, that they had injected the vessels proper to the Hydatid.

Dr Waltherus of Berlin supposed, that he had filled the blood-vessels upon the outer Coat of a Hy-

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* Plate I. Fig. 1.

datid, which was contained within the Liver: But it is not improbable, that he had mistaken the vessels upon the Peritonæum of the Liver for those of the Hydatid.

Watery vesicles, or Dropsical Cysts, as they have been named by some authors, are very different from Hydatids, for in these we observe only a single thin Coat, firmly attached to the neighbouring parts, upon which several blood-vessels, filled by red blood, may be observed.

Such Cysts frequently adhere to the extremities of the Fallopian Tubes, to the ligaments of the Uterus, to the Choroid Plexus, to the Placenta, Kidneys, or are sometimes lodged within the Glandular Viscera, and are also sometimes imbedded in the Mammæ and Testicle. I have seen them filled by a fluid of the colour of the Ink of the Cuttle Fish, when these organs have been reduced to a Scirrhous state.

Though the arteries proper to the Coats of Hydatids be very small, yet the watery liquor which fills the Hydatid is secreted by them, and in some cases even bone.

The Hydatid is probably nourished by absorption, and not by continuous vessels from its Cyst, and may be compared in structure to the Echinus esculentus of Linnæus; that is, absorbent vessels take up its nourishment from the containing Cyst: and in like manner, the small Hydatids contained within a larger Hydatid, after being separated from

it, or loosened from the Ovarium, in which they were formed, suck up their nourishment from the liquor of the Hydatid which contains them.

By what vessels the liquor, which has been absorbed, passes into the cavity of the Hydatid, or forms young Hydatids, we do not know; probably such vessels exist as in the Echinus.

If Hydatids contract, upon the application of a stimulus, it must be granted, that these are under the influence of nerves, though these nerves be so small as not to be obvious to our imperfect senses.

Of the different states in which Hydatids are found.

Hydatids are found in different states.

The rudiment of the Hydatid is connected to the Coats of the pregnant Hydatids, and appears with other small Hydatids, in the form of small excrescences, which are attached to the large pregnant Hydatids.

After a time, these small Hydatids are detached from the parent Hydatid.

Hydatids are subject to diseases.

Hydatids sometimes burst within their Sacs.

We sometimes meet with Tumours, which are made up entirely of pieces of coagulable lymph and Hydatids, the water having been removed by absorption; hence the Tumour does not communicate a sense of fluctuation as when the Hydatids were entire.

The external Coat of Hydatids has sometimes been converted into Bone.

I have several preparations, which afford a striking illustration of the manner in which Bone is formed upon the Coats and Sac of Hydatids. The Ossification begins from a few central points upon the Coats of the Hydatid, and by subsequent depositions, the pieces of Bone gradually become larger and larger, so that at length a considerable mass of Bone is formed.

Of the manner in which the Cysts of Hydatids are formed.

The Sac containing the Hydatid seems to be formed in consequence of the irritation of the Hydatid.

In the same manner, where a large quantity of purulent matter has been contained within the viscera, we generally observe a Sac, provided with Arteries, Veins, Nerves, and Lymphatics, as is obvious from the very varied contents of these different Sacs, and the spontaneous removal or absorption of their contents.

There are also similar instances in the Vegetable Kingdom, as in the production of Galls from the Oak, &c.

Of the Effects of Hydatids upon the Organs which contain them.

Hydatids which attain a considerable bulk, not only mechanically affect the organ within which they are lodged by their pressure, but, by the irritation which pressure gives, produce still farther changes upon it.

On account of the particular stimulus, which Hydatids, as living animals give, the organ containing them, or to which they are attached, undergoes still farther changes, in consequence of an action excited; which perhaps may not improperly be termed *specific:* in proof of which, the organs within which Hydatids are contained, or to which they are attached, are sooner, and to a much greater degree affected, than by the ordinary fixed Dropsical Cysts, whether of the natural or preternatural kind.

Thus, a large quantity of water accumulated in the Ventricles of the Brain in Hydrocephalus Internus, sometimes occasions in an infant a disunion of the Bones of the Cranium from each other, and the head attains an unnatural bulk.

No part of the Cranium becomes soft, thin, or is absorbed. But if Hydatids are lodged in one of the Ventricles of the Brain, (which is not uncommon in sheep), the Cranium over that Ventricle becomes soft, and may be cut without turning the edge of the knife, and loses considerably

of its thickness, and in some cases, holes are formed in it, although the Dura mater remains entire between the Cranium and the Brain; and even although the Cyst containing the Hydatids is still covered by a seemingly sound portion of the Brain, and Pia Mater.

The same happens in the human body; for in the first case stated, where a Hydatid of the size of a goose's egg was found in the right Ventricle of the Brain of a man, covered by a Gelatinous matter, without any fibrous adhesion to the membrane lining the Ventricle, the Cranium was found to be much thinner on its right side than on the left, and in particular, the right Parietal Bone was not thicker than a wafer.

In like manner, the Pleura, Peritonæum, and Vaginal Coat of the Testis have been greatly extended for a length of time, but the containing Membrane continues entire; whereas, when Hydatids are collected within these membranes, a slight degree of inflammation is excited, this is followed by adhesions, the Cyst containing the Hydatids is destroyed, by which the Hydatid escapes from its original situation. There is a much greater disposition to the destruction of the Cysts, which contain the Hydatid, and other containing parts, than when water is accumulated within the shut cavities.

Cases 2d, 3d, 4th, 5th, and 9th, are marked proofs of this fact, and also the case which occurred to Dr

Home. The Hydatids were in that instance probably generated within the Liver, from which they extended to the Abdomen, and also upwards towards the Thorax; and had the patient lived but for a short time longer, they probably would have gotten into the Lungs, as the Diaphragm was extremely thin opposite to the Sacs of the Hydatids: the Hydatids might also have got into the branches of the Trachea, and been discharged by coughing *.

In the same manner, Hydatids formed in the substance of the Kidneys, have worked their way out of the Pelvis of that organ, and have been discharged with the Urine.

As Hydatids seldom prove fatal, when they have found an outlet, and as there is a disposition in nature to discharge Hydatids from the body, an attempt should be made to assist, or to second the efforts of nature by art.

In the first place, a Tumour filled with Hydatids, situated in the extremities, or on the external surface of the body, may be with safety removed. Hydatids lodged within the cavities of the body, may also be extracted, providing the organ containing these has contracted an adhesion with the containing parts, as was done in Case 7th, with complete success.

Plater † has related the case of a young woman who had a Tumour in the right Hypochondrium,

* Vid. Note at the end.

† Vid. Obs. Select. Mantissa, Obs. XVIII. p. 44.

which was very painful, especially when she lay on the left side; it at length burst, and a large quantity of a serous fluid was discharged, besides a number of Hydatids, after which, the patient obtained a complete cure.

Guatanni's * testimony is equally strong. He has related a case, in which the parietes of the Abdomen over a Tumour in the region of the Liver became very thin, and the Tumour, in consequence of violent coughing, at length burst externally, and 300 entire Hydatids, together with a quantity of a serous fluid, were discharged.

The opening remained fistulous for some time, but at length closed, and the patient recovered.

In the same manner, when Hydatids have been accumulated within the Uterus, these may be removed from it, as was done by Dr Kilgour of Musselburgh, with perfect success.

A Lady was supposed to be in labour, and the Doctor was sent for to deliver her. The pains were at first very slight. After some time, a bleeding came on, which led the Doctor to examine the parts. He found the Os Tincæ a little dilated, and discovered that the Uterus was filled by Hydatids. The bleeding continuing, he was induced to endeavour to remove the Hydatids, which he accomplished, and brought away a bason full of these. The Lady got well in a few days, and afterwards had four very

* Vid. Guatanni, de extern. Aneurysmat. p. 119.

healthy children. Thus the cause of the Tumour is removed, which is not effected by opening a fixed Dropsical Cyst.

In many cases where there has existed a swelling of the belly, it has suddenly disappeared upon the discharge of Hydatids, by vomiting and purging. After a time, should another such Tumour begin to form, as in Cases 2d, 4th, and 6th, in these circumstances, though it is by no means certain that the Sac and the containing parts adhere to each other, if the Tumour be stationary, it may even in some such cases, be advisable to puncture the Sac with a large Trocar, and empty it of some, or of the whole of the Hydatids; or if this cannot be accomplished, to inject into it the smoke, or the infusion of tobacco, or a very weak solution of camphor, or to give mercury, or some other substance which may kill the Hydatids, but which is not dangerous to the patient. Prudence, however, suggests the propriety of endeavouring to ascertain, by experiments upon animals, the effects of those liquors which are to be used as injections.

The effect of the smoke of tobacco in Case 8th, in which Hydatids were lodged in the Lungs, is an inducement to the prosecution of such experiments; and there is even reason to suppose, that camphor, turpentine, and some other substances, which are very destructive to worms and insects, and which are readily and safely absorbed in such quantity, as to communicate their taste and smell to the blood in the human body, might in cases of Hydatids be

of use, when taken into the Stomach, or even when applied to the skin of the patient.

Of the Concomitant Symptoms.

As the history of the symptoms occasioned by Hydatids, can be collected only from a variety of cases, I have subjoined several of those, which have fallen under the observation of my Father, and of myself.

Case I.—A stout man, 20 years of age, complained of constant headach, chiefly on the right side, followed by a dilatation of the Pupil, and Epileptic Fits, which proved fatal to him.

On Dissection, the Cranium was found to be much thinner on the right than on the left side, particularly the right Parietal Bone, which in many places was not thicker than a wafer. On opening the right Ventricle of the Brain, a Cyst about the size of a goose's egg was found within it, filled with a watery liquor, and surrounded by a gelatinous matter, which did not adhere to the membrane lining the Ventricle.

Dr Grieve Mackenzie, who had attended the patient, was so obliging as to send the Cyst to my Father, which appeared to me of the same structure as that of Hydatids.

Case II.—A stout man, 26 years of age, had a large swelling, in which fluctuation could be felt, connected with the concave part and under edge of

his Liver. As there had been no symptoms of inflammation or suppuration, my Father supposed the swelling to be owing to a Cyst filled with Hydatids within the Liver. Mr Andrew Wood, who also visited the patient, was of the same opinion. Soon after this, the patient vomited a great number of Hydatids, of different sizes. In the course of the four following years, the Sac filled again, and discharged itself into the Stomach repeatedly.

The Liver was sensibly enlarged, and had descended about an inch lower than the edges of the ribs, and was somewhat more sensible to the touch than usual. This patient's Liver gradually became smaller, and at length retreated within the margin of the Chest.

The patient has enjoyed perfect health for these ten or twelve years past.

Case III.—My Father was consulted by a woman, 40 years of age, who had a large swelling within the left side of her belly, which resembled a Dropsy of the Ovarium; but as she had suffered more pain in it than is common in that disease, he suspected that it might be owing to a Cyst full of Hydatids.

About a fortnight afterwards, the Tumour subsided during the night time, and the patient told him, that she had passed several watery stools with skins in them.

Case IV.—Mr D. C. about 30 years of age, con-

sulted my Father, on account of a large Tumour within the left side of the belly, in which there was the fluctuation of a liquor, and as there had been no symptoms of inflammation and suppuration, he supposed it to contain Hydatids. Several months afterwards, in the year 1775, he was again called to the patient along with his Surgeon, the late Mr John Balfour.

A Tumour in a state of inflammation, projected between the 12th rib, and Os Ilium of the left side, and there was an opening of the skin, at the point of the Tumour, through which it seemed probable that the contents of the Tumour would soon be discharged. It was therefore agreed to enlarge the opening in the skin, and upon introducing the finger into the wound, and pressing on the Abdomen, the fluctuation of the liquor in the Cyst was distinctly perceived. An incision was therefore made into it, and 4 lbs. of Hydatids were discharged.

The orifice closed in a few weeks, and the patient considered himself for several years as cured. But after a time, the patient said that he began to feel another Tumour forming within his belly, in nearly the same place as the former; and a tumour actually formed, which gradually increased in size, but did not give much uneasiness, or prevent him from following business. The Tumour still continued to grow larger, and in the year 1794, my Father was again desired to visit the patient along with his Surgeon, Mr Dewar.

An acute inflammation had taken place, in the same place as formerly, which was followed by suppuration. The Tumour soon burst, and discharged several pounds of a turbid milky matter, in which there appeared to be portions of Hydatids. Two days afterwards, fæculent matter was discharged from a hole, that had been eroded in the left side of the colon. This, notwithstanding the opening, healed in a kindly manner, and the patient enjoyed good health for several years afterwards. He died from a very different disease.

Case V.—The Abdomen of a man, 28 years of age, swelled greatly, owing, as was supposed, to ascites. There was an unnatural opening at the Umbilicus.

On enlarging, and perforating likewise, the containing parts with a large Trocar, about 60 lbs. of Hydatids were discharged: and the late Dr Bate, Physician in Montrose, informed my Father by letter, that the swelling was gone, and the patient had recovered.

Case VI.—About 30 years ago, the late Mr William Anderson, Surgeon in Edinburgh, carried my Father to visit a man, 40 years of age, who had a swelled Liver, which was followed by Ascites, Jaundice, and the discharge of Hydatids by stool, and who died in the course of six weeks. My Father expected to find a Sac with Hydatids attached to

the Stomach or Intestine, and communicating with them; but instead of this, the outer part of the Sac containing the Hydatids was found entire, and did not adhere unto the Alimentary Canal. On opening the Cyst, the concave part of the Liver was found wasted to a considerable depth, and at the bottom of the Cyst, the branches of the Biliary Ducts were seen without dissection, bare, and greatly enlarged, with a number of holes in their sides, through which the Hydatids had passed into the Duodenum.

The great enlargement of the Biliary Ducts was probably produced by the irritation of the Hydatids, and by the mechanical obstruction caused by the pressure of the Hydatids upon the lower ends of the Biliary Ducts, to which the pressure of an enlarged Lymphatic Gland, which lay over the Common Duct, had probably contributed.

Case VII.—In the year 1783, my Father was consulted by Mr ——, 12 years of age, who had a swelling in the upper and right side of his belly. The swelling gradually increased very considerably. In the under part of the swelling, the Liver was felt in a sound state. At last the fluctuation of a liquor above the solid part of the Tumour became very obvious.

As the patient had not lost his appetite for food, had no frequency or fulness of pulse, no bilious disorder, no symptoms of Inflammation, Suppuration, or of Scirrhus in the Liver, my Father imputed the fluctu-

ation which he perceived, on applying one hand to the upper part of the Tumour, and striking it with the other, to Hydatids, contained in a Sac above the Liver, between it and the Diaphragm, and the gradual descent of the body of the Liver to the increase of the Sac, containing the Hydatids. As the Tumour continued to increase in size, my Father proposed to the late Mr William Inglis and Mr F. Dewar, Surgeons, who were now called to him, to *make an Incision into the Sac*, which was agreed to, and performed with much caution.

The Peritoneum lining the containing parts, was found to adhere to the Cyst, which, from the long continuance of the swelling, seemed probable.

Upon dividing the external Coats, a thick, but soft semi-opake membrane presented itself, and on cutting this, 8 lbs. of a clear liquor were discharged, but no small Hydatids. On examinining the soft membrane within which the liquor had been contained, it proved to be of the same structure as other Hydatids, and the Coats were somewhat thicker than any of these, owing probably to its greater size.

My Father now laid hold of the large Hydatid with his fingers, and by pulling it gently, he detached the whole of it from the tough external Coat, formed by the Peritoneum, which inclosed it.

After the operation, the wound was carefully covered by pledgets, and thick compreses, over which a broad flannel roller was applied, in order to ex-

clude the air, to support the Liver, and to keep the opposite sides of the Cyst contiguous.

In a few days, the patient became feverish, he suffered much from thirst, his pulse was quicker than common, and there was a discharge of purulent matter from the sore, a sufficient proof of previous inflammation in the sides of the Cavity.

The cure was completed within ten weeks. I have seen the patient frequently since he underwent the operation. He has had no return of the complaint. He is now near 39 years of age, and enjoys perfect health, and is one of the stoutest men in Edinburgh.

It may be worth while to observe, that in this Case, and in Case IV. no blood-vessels were visible on the proper Coats of the Hydatids, nor in two other such cases, in which the blood-vessels of the Liver, and particularly the blood-vessels of the Cysts which contained the Hydatids, and which were of large size, and had been filled with a coloured size injection. In all these four Cases, no part of the liquor which the Hydatids contained *coagulated*, when ardent spirits were mixed with it, or by boiling it: from which it appears, that the liquor contained within the Hydatid is materially different from that of a common Dropsy of the Belly, or that of the Ovarium.

Case VIII.—I had occasion to visit a man 32 years of age, along with my father, in 1801, on account of a pain in the right side of his breast, be-

hind the Mamma, which was not removed by bleeding, or the application of a blister. He had no oppression or difficulty in breathing, and could sleep on either side, or on his back, and his pulse was not at all affected. He was relieved upon coughing up portions of Hydatids, and also some entire Hydatids, some of which were of the size of a hazel nut, and others as large as a walnut, and he sometimes coughed up these in such quantity, as would have filled a pint bottle. The larger Hydatids contained a clear viscid liquor, and the smaller ones a yellow liquor, which he said had a bitter taste. A few days before coughing up the Hydatids, the patient suffered very acute pain in his breast, which he compared to that of a pointed instrument entering his breast; and for two or three minutes before the Hydatids were discharged, he was seized with violent coughing, and a sense of suffocation, which continued for two or three minutes.

For eight months afterwards, he occasionally coughed up Hydatids.

The disease began when he was 14 years old.

We recommended to him to smoke tobacco, and to draw the smoke as deep as he could into his Chest: He did so, and during the following eight years, had no return of his disorder.

Hydatids have frequently been accumulated in considerable quantity within the cavity of the Abdomen, and have proved an impediment to the pas-

sage of the fæces, or even to delivery: as in the following case.

Case IX.—I had occasion to examine the body of a woman, who had been for a very long time in labour; the natural efforts being inadequate to expel the child, it became necessary to have recourse to the forceps to extract the child.

The patient expired three days afterwards.

Upon examining her body, I found a large mass of Hydatids of different sizes, connected with the upper part of the Rectum, and which had impeded delivery.

Case X.—In this Case, a man of middle age had been afflicted by a Dropsy of the Belly, and Jaundice for some time, when three or four Tumours, of different sizes, appeared in different parts of the parietes of the Abdomen.

These when pressed, evidently contained a fluid.

The patient lived only for a few months.

Upon dissection, the above mentioned swellings were found to be Hydatids adhering to the Peritoneum lining the belly. There were at least 100 Hydatids of different sizes within the cavity of the Abdomen, some of which adhered to the Liver, the others were floating loose in the large quantity of water, which filled the belly.

Case XI.—This Case was treated by Dr Home

in the Clinical ward of the Royal Infirmary. I obtained the following extract from the Journals of the Hospital.

" *5th November* 1807.

" The skin, and the white parts of the eyes of a young woman, have a strong yellow tinge. Her Abdomen is remarkably enlarged; and on examination, two large distinct moveable Tumours are perceived, considerably elevated above the surface of the general swelling. One occupies part of the Umbilical region, and rises a little above the Umbilicus, is circumscribed, hard, unequal, and somewhat moveable. The other is seated in the Epigastrium, towards the left side; is uniformly rounded, immoveable, firm, and elastic. The veins of the integuments covering it are tortuous and enlarged. There is also felt a general hardness along the right side of the belly—She does not suffer pain on motion, or on pressing any part of the Abdomen. General health and spirits little impaired, though she has become considerably emaciated of late. Pulse 90; heat and respiration natural; mouth dry; tongue clean; appetite and digestion good. Body costive; fæces commonly of a natural colour, sometimes black, never whitish. Urine at times rather scanty; very dark-coloured, and tinges linen of a deep yellow.

" Six years and a half ago, she caught a fever, by which she was confined to bed for weeks. During this illness, she could not lie on her right side without pain, and before her recovery, discovered, in the right Hypochondrium, a *Tumour* of the size of

a tea-cup, which was for about a year and a half stationary. Has had pain of the right Hypochondrium, shooting to the right shoulder, and more lately Oedema of the legs. General swelling of belly has come on gradually. She lingered for six weeks under Dr Home's charge.

"Dissection.—The integuments of the Abdomen were found to be very thin over the large Tumour in the Epigastric region, which was filled by a large quantity of yellowish limpid fluid. The Sac containing this fluid being laid open from end to end, was found to consist of two Coats, the external of a dense and firm texture, the internal thick but very tender, of a light yellow colour, very elastic, and adhering loosely to the external Cyst.

"From the inner surface of this internal Membrane, there were numerous distinct masses, of a cauliflower appearance, varying much in size, of a beautiful whiteness on the surface, and were yellow and gelatinous internally.

"The fluid in this Sac appeared to contain numerous very minute Hydatids. This Tumour was situated within the Sac of the Peritoneum, and adhered pretty generally to that Membrane.

"The Tumour was entirely connected on one side with the left lobe of the Liver. The Tumour which was during life felt at the Umbilicus, was found to consist of two lobes, a larger and a smaller, of the same appearance as the former Tumour, to which it was connected by a production of the left lobe of

the Liver, but no communication subsisted between the cavity of the first Sac, and this Tumour, when cut into. This Sac was found to contain numerous Hydatids, some of them were very large, and on their internal surface there were cauliflower productions; others were flaccid, ruptured, and apparently tending to putrefaction, but containing smaller Hydatids, which were entire and spherical, and all of them *tinged with Bile.*

" The Liver was found placed on the right side of the body, its right lobe was low down on the right side, where it had been distinctly felt during life; it was somewhat hard, but otherwise of natural appearance; almost the whole of the left lobe was converted into an enormous Sac, similar externally to the former, occupying the Thorax, adhering to, and pushing up as far as the third rib, especially on the left side the Diaphragm, which was very thin, and with difficulty separated from it. This Sac was found, when opened, to be lined with a delicate Membrane, similar to that of the *first Sac*, but exhibiting no cauliflower protuberances. Within it was contained a large quantity of Serous like fluid, and an immense number of Hydatids of various magnitudes and colours, and all of a spherical form, some exhibiting, on their internal surface, cauliflower like processes, others containing smaller Hydatids.

" The Gall-bladder and Gall Ducts were very much enlarged.

"The other Abdominal Viscera were much deranged in situation, but quite natural in structure, excepting the left kidney, which was much enlarged, and very flaccid. A Hydatid of some size adhered to the mesentery, and three small Hydatids like Globules, were found within the Cervix of the Uterus.

"The Thoracic viscera were sound, and the Heart was remarkably small. No Hydatids were found in the Brain, which was quite healthy."

Case XII.—The last case I shall mention, occurred to Dr Duncan, Sen. whose account of it is subjoined, with the history of the appearances after death, by myself, which fully explained the most remarkable circumstance in the history of the case, the disappearance of the Tumour in the right hypochondrium in the horizontal position.

"*March* 18*th* 1807.

"John Brown, a labourer, aged 38. The whole Abdomen is very much enlarged, and affords to the touch a distinct sense of fluctuation. When in the erect posture, there is observed, about the upper part of the hypochondriac, and extending over the greater part of the epigastric region, a large circumscribed Tumour, possessing evident fluctuation, which subsides immediately on his assuming the horizontal posture, when an uniform tense swelling occupies the whole Abdomen. Pressure applied un-

der the margin of the false ribs, on the right side, excites so considerable a degree of pain as to cause him to wince under it.

"The skin over the whole body, and the tunica adnata of both eyes, are of a deep yellow colour. The urine also is observed to have a very dark yellow appearance, and linen, when immersed in it, is very deeply tinged. The alvine excretion is said to be of a white colour, and rather thick consistence.

"He is affected with occasional sickness, and inclination to vomit; but he has never complained of pain in the Epigastrium. He complains of great dyspnœa, which is always most severe in the morning, and is induced on stooping forward or making any exertion. He is also much affected in the evening, particularly at first lying down, with a severe cough, which, by his account, is extremely urgent, except when lying on the left side; and is accompanied by a difficult, though copious viscid expectoration, having a bad taste and smell. It excites the dyspnœa to a great degree, which then requires the erect posture.

"Pulse 100; tongue white; great thirst; heat moderate; urine very scanty; belly costive; and he is distressed with frequent tenesmus; appetite much impaired; sleep disturbed by frequent startings."

"Dissection.—The dropsical water in the Abdomen was as dark coloured as the urine of the patient

was on his admission, and gave a deep yellow tint to cloth immersed in it. The impregnation from bile had, indeed, gone farther than in any case I recollect to have seen, for the cartilages of the ribs were coloured by it to the centre.

"The surface of the Liver had somewhat of a mottled green colour, very like to many marbles, and more especially to the Portsoy serpentine. The substance of the liver had also the same appearance, with the exception of the centre of the right lobe, which was rather of an olive or dirty yellow colour.

"The Liver was of an uncommon bulk, and the convex surface was more prominent than usual towards the middle. This was not owing to any disease in the glandular part of the organ, but to a Sac of a yellow colour, and of the size of a large orange, though of an oval shape, and irregular in its surface, situated in the region of the portæ of the Liver.

"Over this Sac, which was filled with Hydatids, the vena portarum, the hepatic artery, and its great branches, as also the hepatic nerves, which were much larger and much harder than common, passed; and the branches of the hepatic nerves could be distinctly traced along the gall ducts.

"The Hepatic, Cystic, and common ducts were so much stretched in their course along the surface of the large sac, as scarcely to admit of air to pass through them. The ductus communis was much enlarged in the portion not compressed next the Liver.

"The Gall-bladder contained but a small quantity

of bile, and, from being contracted in several places, had an irregular figure, and scarcely exceeded, in size, that of a child's at birth; and over this bowel, there was a broad preternatural membrane uniting the Liver to the great arch of the colon. The lymphatics from the Liver did not contain bile, and were not coloured by it.

" The adjacent parts betrayed marks of previous inflammation. The Stomach and great arch of the Colon were more intimately united than usual by the Omentum; and there was also a strong adhesion between the Liver and the Kidneys.

" All the parts adjacent to the liver, more especially the kidneys, were tinged of a deep yellow colour."

Conclusion.

The preceding history of Hydatids seems to me to have established the following propositions

1st, That Hydatids are not peculiar to any one part of the Human Body, and are most commonly connected with the investing membranes of the Liver, Ovaria, or Kidney.

2d, That there is no resemblance between the Hydatids which are peculiar to Quadrupeds, and those of the Human Body, as is obvious, by comparing the preceding description of the Hydatid of the Human Body, with those of the Hydatids of Quadrupeds, which have been published by Hartmannus *,

* Vid. Mis. Nat. Cur. Dec. 2. An. 4to.

Tyson*, Pallas†, Schroeder‡, Fontana§, and E. Home‖.

3d, That there is every reason to conclude, that Hydatids are animals.

4th, That observation and experiment have not yet determined in what manner Hydatids are generated, or deposited within certain bowels.

5th, That as the smaller Hydatids adhere to the inner surface of the larger, the larger Hydatids may be called pregnant; or that these animals are multiplied like some vegetables, by the adhesion of the smaller Hydatids to the Coats of the larger Hydatids.

6th, That the Coats of the Bowels containing the Hydatids are much more frequently destroyed, than when water only has been collected within these; hence the Hydatids escape from their original situation, and sometimes find their way by unnatural passages into the Intestines, Urinary or Biliary Canals, into the Windpipe, &c.

7th, That many patients recover upon the discharge of the Hydatids.

8th, That Hydatids may even when adhering to one of the bowels of the Abdomen, be removed, by incision, providing there exists an adhesion between that viscus and the parietes of the Abdomen.

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* Vid. Phil. Trans. for 1691.

† Vid. Misc. Zoologic.

‡ Vid. Schroeder de Hydatid.

§ Vid. Opus Scelti, Tom. 6.

‖ Vid. Phil. Trans. for 1795.

NOTE.

Since the preceding sheets were printed, I accidentally turned up the First Volume of the London Medical Communications, and was much gratified to observe, that what I had affirmed might have happened in the case treated by Dr Home, had actually taken place in a case described by Dr Foart Simmons, who has stated "that upon pressing the thorax, Hydatids poured out in great quantity from that cavity into the Abdomen, and upon introducing a finger at the part from which they issued, we found that it had passed with ease into the thorax, through an opening in the upper and fleshy part of the diaphragm.

"The sternum being now carefully removed, a most singular appearance presented itself to our view:—On the right side, the liver was seen extending from the spine of the ilium up to the fourth rib. As the diaphragm was pushed so high up on that side, the right lobe of the lungs was compressed into a very small space, but without being apparently diseased. The heart and pericardium were likewise in a sound state, but the texture of the left lobe of the lungs was in a great degree destroyed by suppuration.

"In tracing the course of the great cyst already spoken of as filling the left side of the Abdomen, we found it perforating, as it were, the diaphragm, and then expanding again, adhering to the pleura and mediastinum, and filling almost the whole of the left cavity of the thorax. The upper part of this sac communicated in several places with the diseased lungs, and upon pressing the latter, matter flowed into the cyst. We introduced a probe into one of these passages, and it passed far enough into the substance of the lungs to account for the expectoration of pus through those channels. If the patient had lived much longer it is possible she would have coughed up Hydatids, as one of the openings from the cyst into the lungs, was large enough to admit a goose quill."

This case affords an additional, and very strong illustration of a partial absorption taking place in that bowel within which Hydatids were lodged, and of the formation of an unnatural passage, through which the Hydatids might have escaped into a branch of the Windpipe.

The case recorded by Dr Collet, in the second Volume of the Transactions of the College of Physicians of London, forms an important appendix to the former case, for in this instance, the Hydatids which were originally lodged within the liver, were discharged by coughing. It is stated, there was at first observed, "an irregular tumour, not very large, seated in the lower part of the Epigastrium, about four or five fingers in breadth, below the Xiphoid Cartilage, extending itself towards the right Hypochondrium. In the most prominent part of it, a fluid is distinctly perceived, which seems to be immediately under the common integuments."

Dr Baker, who has subjoined his remarks upon the case, has observed: "If then a conjecture on a subject, which is at present obscure, and which admits of no demonstration, may be hazarded; is it not possible, that, by the gradual operation of morbid effects, a communication may have been opened between that tumour (alluding to the tumour situated above the navel), and a branch of the Trachea?"

From what had occurred in several of the preceding cases, it seems to me *certain*, that such a communication had existed, *and that the Hydatids which were discharged by coughing, had been generated within the Liver.*

SECTION XXIV.

Of the Organic Derangements of all the Coats of the Alimentary Canal.

Inflammation which had begun in the Villous or Peritoneal Coats of the Alimentary Canal, is rapidly communicated from the original seat of the disease, to all the other Coats, and interrupts the function of the part affected. It produces various effects, and amongst others, gives rise to stricture.

Of Stricture of the Alimentary Canal.

Amongst the causes which obstruct the Alimentary Canal, stricture merits particular mention.

The stricture is a temporary or permanent disease; the former originating from an inordinate spasmodic contraction of the Muscular Coat, the latter from a permanent organic derangement of some part of the Alimentary Canal.

It seems not improbable, that both these very opposite causes of obstruction, are occasionally combined, as all patients who labour under a permanent obstruction, suffer occasionally from a considerable aggravation of the symptoms.

Beside the species of stricture, occasioned by the Villous Coat only, which has already been describ-

ed, there are two kinds of stricture, in which all the Coats of the affected part are more or less thickened, and also indurated.

The 1st may be called the inflammatory; the 2d, the Cartilaginous, or Scirrhous Stricture. The first is met with at all periods of life, is often the immediate consequence of acrid substances being swallowed, of concretions, of dysentery, and of external violence, and it appears in a short time after the violence has been inflicted.

Upon dissection, we observe a thickening of all the Coats at the seat of the stricture, an effusion of coagulable lymph between them, and the blood vessels at the seat of the stricture, which were much enlarged, and distended by blood, form a net-work upon it, and there is also a quantity of turbid serum effused into the cavity of the Abdomen, when the disease is seated in the Intestines.

The second, or Scirrhous Stricture, is of slow growth, appears only in persons who are far advanced in life, of a sallow complexion, and who are disposed to cancer, or in those whose constitutions have been much impaired; and upon dissection, we meet with a constriction of an inch in length, of a Cartilaginous consistence, and in which there is no appearance of the Coats of the Alimentary Canal; all of these having been absorbed, Cartilaginous matter having been deposited in their stead. This species of constriction generally terminates in the Cancerous Ulceration. It is very easy to discover

the seat of the stricture, for that part of the Alimentary Canal which is above the stricture is much enlarged; whereas, that beneath it is much contracted, and by tracing either of the dilated or contracted portion, we soon discover a part of the canal which seems much contracted, as by a cord having been put around it, and which had left a purple mark: and upon pressing this part, it feels heavy and hard.

Strictures generally take place at that part of the canal which is naturally most contracted.

In my Thesis, De Dysphagia, I have observed, speaking of stricture of the Gullet, "Membrana Oesophagi interior, per duos aut tres pollices, ubi pharynges ad formandum Oesophagum contractio fit, aut prope ventriculum sæpe densatur ac coarctatur."

Stricture is more common at the Pylorus than in any other part of the Stomach.

Strictures are frequently found in the smaller Intestines, or in the middle of the transverse arch of the Colon, which is the most contracted part of that bowel, and the same remark may also be applied to the Urethra, to the Biliary Ducts, and even to the Uterus*.

The part above the stricture, besides being consi-

* Dr Baillie has remarked, that stricture almost always takes place at one part of the cavity of the Uterus, viz. where the cavity of the Fundus Uteri terminates, and that of the Cervix begins; for in this place, the cavity of the Uterus is narrowest. As the sides of the cavity round this place lie very near each other, and

derably extended, is often inflamed, ulcerated, and sometimes eroded, which proves, in some cases, the means of prolonging, but in others, of destroying life, as when pus flows from the Gullet into the Windpipe. Sometimes the part above the stricture suddenly gives way, and the patient dies in an hour or two.

The Mucous Glands above the stricture, are always considerably enlarged.

Symptoms of Stricture.

Strictures occasion various local, and also constitutional symptoms.

Of the former class, are pain, soreness, sense of tightness in the part affected, and the discharge of a ropy and very tenacious mucus, which may be drawn out for some feet.

The constitutional symptoms are, great anxiety, despondency, impaired digestion, costiveness, fever, quick pulse, sometimes hysteria, and epilepsy.

The organic permanent stricture, sometimes is complicated with the temporary spasmodic stricture; hence the sudden and temporary aggravation of the symptoms from catching coldor from the stricture being irritated.

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form naturally a small aperture, it is probable, that some slight inflammation may unite the parts together, and shut up the aperture, or the parts may gradually approach each other, without this cause, as in strictures of the Urethra.

The permanent stricture is of slow growth, and the constriction becomes greater and greater, from the gradual approximation of the opposite sides of the Canal, and there is no remission of the symptoms.

The stricture from Spasm sometimes comes and goes off suddenly, and is generally but of short duration; its course may be arrested by proper remedies, and, by external pressure, a hardness may in some cases be felt in the part affected.

Of the Symptoms of the Permanent Organic Stricture of the Gullet.

Those who have been afflicted by this disorder, have generally what they call a narrow swallow from their birth, which increases to such a pitch, as to create difficult deglutition.

The attempt to swallow, proves a source of much irritation; the patient has what he calls fits of choking, especially when he does not swallow with great caution, and perceives even fluids stop at a certain part of the Gullet; a guggling noise is then heard, like water passing through a very narrow channel, and a part of these, after being detained for two or three minutes, gets down, and the remainder is rejected, and escapes through the nose and mouth, or passes into the windpipe, and occasions violent coughing.

A very great exertion is required to get over solids, and during the effort, many patients suffer from difficult breathing, and some even are convulsed.

The catching cold, or any other irritation, adds very much to the difficulty of swallowing, which is probably owing to an inordinate spasm in the Muscles of the Gullet being induced, and this is attended by the discharge of a great deal of Phlegm.

The small quantity of food which passes the constriction of the Gullet, being inadequate to the nourishment of the patient, he becomes extremely thin, weak, and very irritable; and the constriction becoming daily greater, he at length dies from inanition.

It sometimes happens, that the progress of the stricture has been arrested by pregnancy. I had occasion to attend a woman with a stricture in her Gullet, who became pregnant, and who suffered much less from her disease during the months of her pregnancy than she had done before that period, but after delivery, she swallowed with greater difficulty, and at length the obstruction in the Gullet became so considerable, that very little of her food reached the Stomach, and she died in a few months from inanition.

The nature of the disease can only be ascertained by the introduction of the probang*.

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* Mr Home has observed, "This part of the Œsophagus (viz. that part immediately behind the Cricoid Cartilage of the Larynx), is liable to two other diseases which produce nearly the same symptoms, and therefore, when the cases are not accurately examined, may be mistaken for stricture.

"One of these is a thickening of the Coats of the Œsophagus, which extends to the surrounding parts, and in the end generally becomes cancerous, or, in other words, an incurable disease; the

Consequences of the permanent Organic Stricture of the Gullet.

These are various:

1st, The part of the Gullet immediately above the stricture, is in most cases prodigiously enlarged and ulcerated on its surface.

A remarkable instance of this enlargement above the stricture was sent to me by Dr MELVILLE of St

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other is an ulcer on the lining of the Œsophagus: this last is commonly a little below the seat of stricture, and is upon the posterior part which lies upon the vertebræ of the neck. Both of these produce a difficulty in swallowing, and in their early stages are only to be distinguished from stricture by an examination with the bougie; when the disease is more advanced, the other symptoms which arise sufficiently explain the nature of the disease.

"When a bougie is passed with a view to determine the nature of the complaint, and it passes down to the distance of eight inches, measuring from the cutting edge of the front teeth in the upper jaw, the surgeon may be satisfied that it has gone beyond the usual seat of stricture; and if it is brought back without any resistance, he may conclude, that the aperture of the Œsophagus considerably exceeds the size of the bougie which had been used. But if the bougie stops at the distance of 6 and $\frac{1}{2}$ inches, or even lower, he is to retain it there with an uniform steady pressure for half a minute, so as to receive on its point an impression of the surface to which it was opposed. If the end of the bougie retains its natural form, or nearly so, and there is an indentation like the mark of a chord on its side, whether all round or only partially, he may decide that the disease is a stricture; but if, on the other hand, the bougie passes without any difficulty to the distance of $7\frac{1}{2}$ inches, and when brought back the point has an irregular jagged surface, it is equally clear that the disease is an ulcer on the posterior surface of the Œsophagus." Vid. E. HOME's Pract. Obs. on Strictures, Vol. II. page 397.

Andrews, with the history of the Case: He observes, "that the enlargement above the stricture was so great, that the patient could retain nearly a pint of nutritious liquid, composed of eggs, milk, and sugar, for ten minutes, conversing with his friends during that time." He died eight months afterwards, the stricture being in that stage of the disease incurable, for upon the introduction of an instrument, it passes more readily into the Sac, than against the stricture, hence there is no chance of dilating the stricture.

Upon dissection, it was found, that a common probe could scarcely be passed through the constricted part of the Gullet.

When the stricture is seated near the Cardia, and when there has been considerable dilatation of the Gullet above the stricture, this disease has been mistaken for an organic derangement of the Stomach, as the patient suffers pain in the region of the Stomach, and what is taken, is rejected by vomiting.

2d, Ulceration below the stricture, sometimes, according to Mr E. Home, takes place, and by extending upwards, sometimes destroys the stricture. I have seen a stricture of the Urethra removed in this manner.

3d, From the continuance of the ulceration of the Gullet, erosion follows, and the matter getting into the Trachea, proves fatal in a very short time, as in the following Case.

I attended for three years a person who laboured under a stricture of the middle of the Gullet, during the whole of which time, he was incapable of taking as much food as was sufficient to allay his hunger.

The patient was a letter-carrier, and therefore had been exposed to the inclemency of the weather.

The disease began like a common sore throat, he had a slight soreness in the part, and swallowed with difficulty.

He had frequent hawking and spitting, probably owing to the neighbouring parts being in an irritable state, and secreting an unusual quantity of mucus. The soreness soon went off, but his voice became much weaker, and the difficulty of swallowing gradually increased.

He also breathed with difficulty, and especially upon attempting to swallow, and a part of his food was commonly returned.

From the continuance of the disease, he became much emaciated, and his pulse was small and quick.

Notwithstanding a long protracted course of Mercury, Cicuta and Hyoscyamus, the disease increased; and after having laboured under it for three years, he died very suddenly.

Upon examining the body, a stricture was found in the middle part of the Gullet, about half an inch in extent.

The Oesophagus internally, immediately above the stricture, was in a state of ulceration, and all the Coats of the Gullet were found to be eroded, and there was an oblique Canal through which a probe could be passed into the Trachea.

The sudden death of the patient seemed to have been owing to the purulent matter getting into the Trachea.

EXPLANATION OF PLATE VIII.

The drawing from which this engraving was copied, was taken from the body of the man whose case has been described in the preceding pages.

A A, The part of the Gullet above the stricture which was considerably dilated, and the innermost Coat has fallen into folds.

B, The ulcerated part of the Gullet above the stricture F.

C, The Trachea.

D, A probe passed through an unnatural communication between the Gullet and the Windpipe.

F, The Stricture of the Gullet, which is very similar to that of the Urethra.

G, The Glands in vicinity of Gullet enlarged.

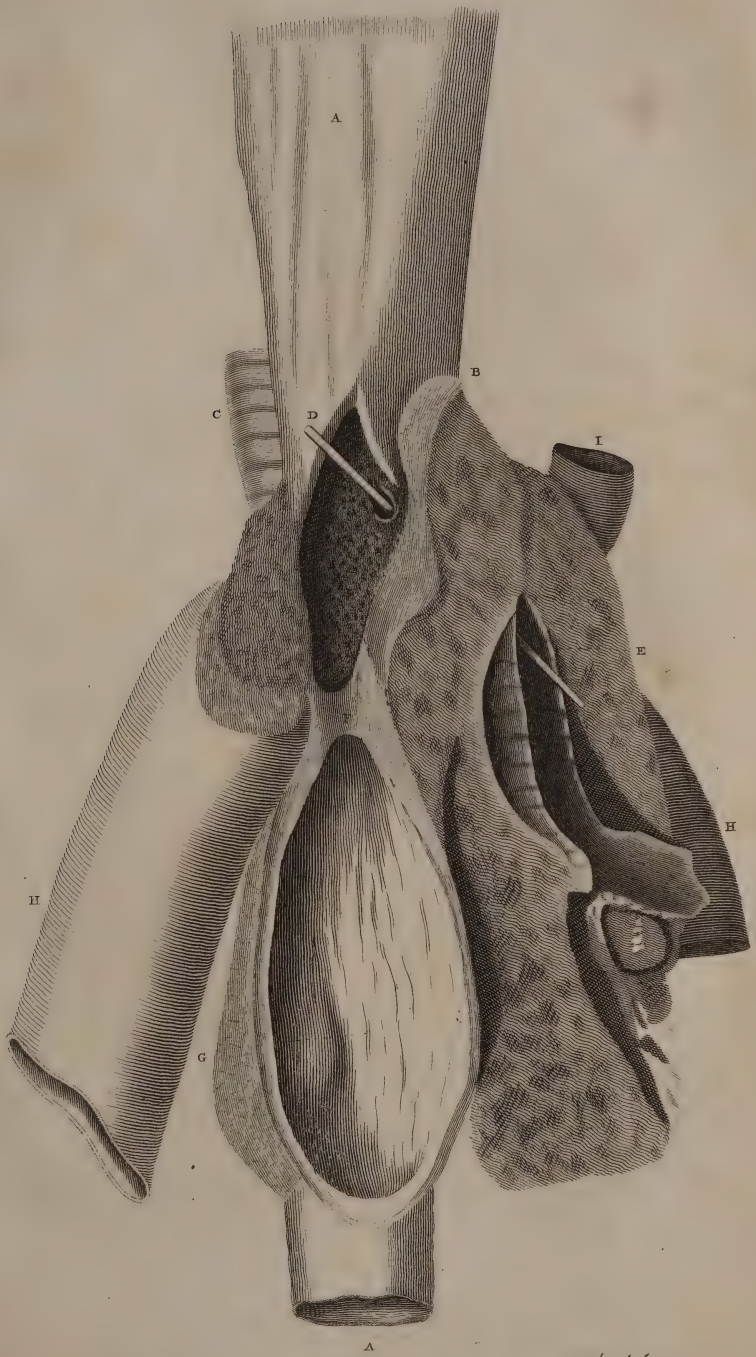
H H, The arch of the Aorta.

Of the Double Permanent Stricture.

Two strictures have frequently been observed in the course of the Urethra, Biliary Ducts, and Intestines, and sometimes, though much more rarely in the Gullet: and I am indebted to Mr Astley Cooper for a drawing of such a case.

The strictures are at the distance of an inch from each other, and the uppermost one is situated nearly opposite to the Cricoid Cartilage of the Larynx.

PLATE VIII.



A. Fyfe del.

W. Archibald Sc.

Of Stricture of the Intestines.

Strictures of the Intestines bear an exact resemblance to those of the Gullet, which have already been described, with the exception, that they are sometimes of greater length. There was a preparation in the Museum of the University, in which a stricture of the Ilium was seven inches long.

Strictures are more frequently met with in the Colon and Rectum, than in the smaller Intestines; and I have seen the natural calibre of the Colon so much reduced by this disease, that it would give passage to a goose quill only.

Above the stricture, the Coats of the Intestines are frequently ulcerated.

In the Cancerous stricture of the Intestinal Canal, there is not only a very great degree of thickening of the Coat of the affected bowel, but also tumours of different sizes, of a malignant nature, which tend still farther to lessen the aperture through the stricture.

The appearance of stricture in the Rectum, has been so faithfully described by Dr Kerr, in the 24th page of this Volume, as to supersede the necessity of further description.

Stricture in the Intestines gives rise in its earlier stages to colicky pains, to costiveness, alternating with Bilious Diarrhœa. After some time, solid fæces are very rarely passed, and only after a great effort; and these are by no means of the natural size, being generally not larger than a common-sized

writing quill. A purgative affords but temporary relief.

The stricture in some cases occasions an inflammation of the Intestines.

A rupture of the Intestines above the stricture sometimes take place; and when this has happened, the patient, after labouring under colic for a few hours, is suddenly seized with very acute pain in his bowels, like that occasioned by a strangulated hernia; followed by the sudden sinking of the pulse, by cold sweats, syncope, and death in four or five hours.

Before concluding this section, it is necessary to mention a particular species of stricture of the Gullet, which has been described to me by Mr Astley Cooper, in a letter which I lately received from him.

" It is a species of stricture, which occurs in young women of nervous habits, and who do not suffer from Globus Hystericus. This kind of stricture easily yields to the bougie, but returns in twenty-four hours. By the frequent use of the bougie, viz. every day for a month, this kind of stricture has been cured. It is probably spasmodic, but is unattended with pain, or any other convulsive symptom."

SECTION XXV.

Of Scrofula of the Alimentary Canal.

The Scrofula of the Alimentary Canal is a disease,

which, though frequent, has not been described with sufficient accuracy.

When the Stomach or Intestines become the seat of Scrofula, all the Coats of the part affected attain an unnatural thickness. I have seen the Coats of the Stomach half an inch thick, and instead of being heavier and harder, and indurated as from Scirrhus, they become softer, and more of a spongy consistence than natural.

There is another peculiarity in this organic derangement, which distinguishes it from Cancer; it is not limited to the Cardia or Pylorus, but affects the whole of the Stomach, and instead of being limited to a certain portion of the Intestines, affects the whole Intestinal Canal.

Upon making a section of the diseased Intestines, we cut through a substance of an uniform consistence, which somewhat resembles the white part of the skin of the orange, through which a great many blood-vessels are distributed.

The Coats of the diseased part are rarely of an uniform thickness, being generally thicker towards the right side of the Stomach, where I have seen them half an inch in thickness.

In some cases, we observe small conical swellings growing from the Villous Coat of the Stomach, and upon the same Coat there are generally patches of a florid red colour; the Stomach always contains a quantity of a very viscid Mucus.

A very peculiar species of Ulceration follows the unnatural thickening of the Coats of the part affect-

ed by Scrofula, and which was, I believe, first described by Dr Carmichael Smyth, in the second volume of the London Medical Communications.

The size of the Ulcer varies from that of a sixpence to that of a crown-piece, its form commonly circular or oval.

The erosion of the Villous Coat is more extensive than that of the muscular; the perforation, or opening through the Peritoneal Coat is much the smallest, and seems produced by sudden rupture. The edges of the ulcer are found well defined, somewhat thickened, rounded, and sometimes hard, a proof of its long standing. The disease is confined to the Villous and Muscular Coats of the Stomach, whereas the Peritoneal is always free from disease.

The appearance of the ulcer is widely different from that of cancer, which has a ragged and uneven surface, which is always accompanied with acute pain, and other symptoms of alarm; whereas, in this case, there is no indication of the internal mischief, no symptoms of uneasiness, or any warning of approaching danger until the fatal catastrophe.

The bursting of the Stomach is immediately followed, and may be distinguished by the vomiting ceasing, whilst there is a considerable degree of distention of the Abdomen, and by the entire failure of the Pulse, the patient, excepting lowness, anxiety, and restlessness, making no complaint either of pain or sickness.

The same kind of general thickening of the Coats of the Intestines, and of ulcers, are sometimes found

upon dissection, in different parts of the Intestinal Canal.

The neighbouring Lymphatic Glands are always much enlarged, and when cut through, are found to be in the same morbid state as the Coats of the bowel primarily diseased.

When the Stomach is reduced to this morbid state, I have frequently observed the Omentum Majus considerably thickened, and drawn upwards on the under margin of the Chest.

This disease attacks children, and also those in the meridian of life; whereas, the aged more frequently suffer from Cancer.

SECTION XXVI.

Of the Coats of the Alimentary Canal reduced to a Pulpy state.

This peculiar and rare organic derangement of the Coats of the Alimentary Canal, has not, as far as I know, been described by any writer on Pathology.

The affected part is much enlarged, and its Coats, which are much thickened, do not possess their usual firmness, but feel very soft and pulpy, though not of a black colour, are not dilatable, and emit a very peculiar sweetish smell. There is a quantity of dark-coloured, and very offensive bile contained within the Intestines. The Mesenteric Glands are generally enlarged, and sometimes ulcerated.

In order to throw light on the nature of this rare organic derangement, I have subjoined the following case:

8th October 1809.

A Gentleman, æt. 48, who was much emaciated, and with a weak, though regular Pulse, consulted my Father, along with Dr Sanders, on account of uneasiness in his belly, accompanied by occasional heartburn and vomiting, and he had generally five or six liquid stools every day, after which he felt easier.

His stools were sometimes slimy, and streaked with blood. The Diarrhœa was succeeded by obstinate costiveness, and great oppression.

There was no swelling nor tension in any part of his belly, though he suffered pain upon pressing it. He had been in the above state for the last twenty years of his life,

About eighteen months ago, he became extremely costive, and continued so for nine days, notwithstanding the use of the most powerful purgatives, after which, he was seized with a very copious Diarrhœa, by heartburn, and occasional vomiting.

By the use of camphor, combined with opium, his Diarrhœa was somewhat alleviated, and the stools acquired nearly the natural consistence, and his body became more regular.

About an year before his death, a Tumour was perceived opposite to the Navel; when my Father recommended to him to try the effect of hemlock, and by the use of which, he was somewhat relieved.

On the 26th of August of the following year, he was suddenly seized with shivering, universal paleness, and severe spasms of the legs, which were removed by the tinct. opii. ammoniat.

On the 2d October, his bowels were very much distended, and his belly swelled, and a fluctuation could not only be easily felt, but was distinctly heard; and generally, a few minutes after handling the Abdomen, the fluid moved with a guggling noise; and upon being pressed, passed to another part nearly opposite.

The stools procured by Calomel and Rhubarb, were of the appearance and consistence of thin tar, and the Abdomen still tense. He became cold and feeble; pulse very feeble, quick and intermitting; his breathing scarcely perceptible; thirst urgent; urine loaded with white sediment, and scanty.

Dr SANDERS prescribed thirty gtt. of the tincture of Digitalis, with an equal quantity of the spirit of lavender, to be given thrice a-day in a little port wine. He died on the 10th of the month.

Appearances on the Examination of the Body.*

"Upon the Abdomen being laid open by a crucial section, a great quantity of fœtid flatus escaped.

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* I am indebted to Dr SANDERS for the following account of the appearances on dissection, and also for the morbid parts.

"The Omentum was of a dark grey colour.

"The Parietes below the Umbilicus were much thickened, and adhered firmly to the Omentum and Viscera.

"The convolutions of the Intestinal Canal, which were much distended above the Umbilicus, adhered firmly to one another.

"A little below the Umbilicus, the Ilium was of an enormous size and thickness, and for the length of at least 12 inches, of a light green colour. The mesentery was covered by a net-work of vessels, distended with red blood.

"The Glands of the Mesentery immediately behind the Navel, were very much enlarged, where a congeries of them formed a mass nearly equal in size to an orange.

"A portion of the Ilium, about a foot in length, was remarkably tender, and could hardly be touched without the finger injuring it. The inside of the Gut was covered with Indurations, Tumours and Ulcers.

"The Muscular substance of the Pylorus seemed to be sound, and was surrounded by small indurated Glands, one of which, not larger than a bean, was very hard and dense."

The above disease seems to me to bear a strong resemblance to that peculiar organic derangement of the Bladder of Urine, which has been described by Dr Gilchrist of Dumfries, in the Edinb. Phys.

Essays, Vol. III. In both, the part affected was much enlarged, and its Coats were much thickened, and had lost their contractile power, so as to be incapable of propelling their contents; and the contents of the Intestines and of the Bladder of Urine, were, by pressing these bowels, discharged; and in both, the disease had been of considerable duration *. In both cases, there seems to have existed a low degree of inflammation, and Dr GILCHRIST speaks of the bladder being *tender*, and of the disease terminating in *an incurable ulceration* †.

The analogy fails only in respect to the morbid appearances, but that may be explained.

Dr GILCHRIST has described but one instance, in which he himself had an opportunity of examining the appearances after death. He observes, "the Bladder was one-fourth of an inch thick, and remarkably firm," whereas, in the case of the Intestines, the Coats were thick, and very soft and pulpy. But, notwithstanding the difference in the texture of the Intestines and Bladder, I consider the disease I have described, and that described by Dr GILCHRIST, as only different stages of the same organic affection. In Dr GILCHRIST's case, the disease had not arrived at its acmé, as in the case I have described, of which Dr GILCHRIST's own words are sufficient evidence.

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* Dr GILCHRIST calls it a slow disease.

† Vid. Edinb. Phys. Essays, Vol. III. p. 495.

He has observed, " he (the patient) was seized with universal rheumatism, this was succeeded by a periodical *vomiting of bile,* continuing for some days, and returning once in two or three weeks; from every fit of which, he very hardly recovered. A severe catarrh next attacked him, and incessantly teased and *exhausted* him." Vid. page 479. He adds in the next page, in describing the appearances on dissection, " *the Liver was very large.*"

SECTION XXVII.

Of the Induration of the Coats of the Alimentary Canal.

Much has been written by the French pathological authors respecting the Induration of the Alimentary Canal, by which, the Coats of the affected part acquire an unnatural hardness and thickness, and thus the diseased part is considerably contracted in its diameter.

This morbid condition of the Alimentary Canal has been stated to take its origin from inflammation. As I cannot add from personal observation to what has already been written upon this subject by Dr Portal, I beg leave to refer the reader for information on this subject to that author.

SECTION XXVIII.

Of the Dilatation of the Alimentary Canal.

The dilatation of part of the Alimentary Canal is a very common effect of any cause which obstructs the progress of its contents.

The distended portion is frequently much thinner than the rest of the Alimentary Canal, and hence often gives way.

SECTION XXIX.

Of Rupture of a part of the Alimentary Canal.

There are several cases of rupture of the Gullet upon record, and I have a preparation before me, in which the Gullet of a child has been ruptured to a considerable extent, in a longitudinal direction.

But sometimes the rupture of the Gullet is transverse, as in the case related by Boërhaave. The patient, upon the rupture taking place, suffered very acute pain, his face became pale, his pulse small, his extremities cold, and his body was bedewed by a cold sweat. He died in eighteen hours, after having suffered extreme agony.

Mr Dryden * has related the case of an Officer whose Gullet was ruptured from the action of vo-

* Vid. Edinb. Med. Comment. Vol. XII.

miting. The patient felt something give way internally, which gave him very acute pain, and a sensation, as if he had received an injection of some liquid into the cavity of the chest, which, upon dissection, was found to be the case.

A similar case was communicated to me by Dr Carmichael Smyth.

The rupture of the Stomach is still more frequent than that of the Gullet.

The Stomach of quadrupeds has been ruptured from over-distention by food, or from air generated from the food, even when its Coats have been perfectly sound.

The Coats of the Stomach have sometimes been perforated by extraneous bodies, that have been accidentally swallowed, or they have been eroded by abscesses, beginning in the Cellular substance of the Stomach, or by the Scrofulous or Cancerous Ulceration.

The Coats of the Intestines have also been still more frequently eroded or destroyed by ulceration, or have given way where there has been a mechanical obstruction to the progress of their contents from Alvine Concretions, Organic Strictures, &c.; and as soon as the rupture of the Stomach or Intestines has taken place, the patient sinks rapidly, syncope follows, and he dies in a few hours; excepting when the Stomach or Intestines adhere to the parietes of the Abdomen, as often happens in a strangulated hernia; then the contents of those bow-

els are in some instances discharged through the aperture for a time, and afterwards resume their former route.

Within these few days, (July 2d, 1811,) I visited, along with Dr Graham of Dalkeith, a Lady, who was reduced to a very miserable state, in consequence of there being a fistulous orifice at the right side of the Navel, through which part of her food, air, a proportion of the fæces, bile, and purulent matter passed. The bowels were rather torpid, and the stools had not the usual colour. Her belly, though much swelled, was not painful, even when rudely pressed, and there was no peculiar hardness perceptible in any part of it, or in the region of the Liver. Appetite pretty good, and her pulse was about 96 in the minute, and equal.

In November last, she was seized with acute pain in the Stomach, which was much increased on pressure, and attended by constant nausea and sickness, followed by an intolerable pain and swelling in her right side, which was painful on pressure, and extended towards the Navel. She continued in this state for several months. At length the Tumour became discoloured, and an obscure fluctuation was perceived; a poultice was therefore applied, and the matter pointed at the right side of the Navel, which induced Dr Graham to make a small puncture with a lancet into the most prominent part of the Tumour, (with the view of preventing the matter from getting into the Cavity

of the Abdomen); upon which, a quantity of well-conditioned pus was discharged.

The pain in the right side still continued.

In the course of a week, matter burst forth at two other orifices; one in the Navel, and the other on the right side, and about an inch distant from it, and through these also the bile and her food passed. About eighteen months afterwards, she had acute pain, especially in the region of the Liver, which stretched towards the Navel, where a dark-coloured Tumour, about the size of a chesnut, presented itself; a poultice was applied, and soon afterwards a Biliary Calculus of a large size worked its way through one of the Orifices above described: and in the course of nine days afterwards, two concretions, in all respects similar to the former, were discharged; and these concretions, before their escape, and also during their passage, created the most excruciating agony.

As soon as the Biliary Calculi had passed, the pain subsided, and the patient's health began to improve, and the orifice of the Sinus became much less, and now would admit only a common-sized probe. The Bile, and a part of the food still continue to pass through the unnatural passages.

Were it not for the large quantity of bile which flows continually through the orifices, which probably is derived immediately from the Gall-bladder, (for I cannot suppose that three such large Biliary Concretions could have passed through the Gall

Ducts), I should entertain a favourable opinion as to the result, as there have been many examples of an opening in a portion of Intestine which had been strangulated closing, though the contents of the Intestinal Canal had for a time passed through it.

Though foreign to the present subject, it may not be improper to add, that this Lady, eighteen months ago, after having had the sensation of insects moving within the Bladder, discharged, along with her Urine, the Larvæ of Insects alive, such as have been described and represented in the Edinburgh Medical and Surgical Journal, Vol. VII.

There is still another way in which life has been protracted, even though a portion of the Intestinal Canal has been ruptured, viz. by a layer of coagulable lymph surrounding the rupture.

I have subjoined a remarkable case of the above description, which happened to a young man, whom I attended along with Dr Forbes. When Dr Forbes was desired to visit him on the 6th of January 1808, he had been occasionally much griped, and purged, and his belly was tense and painful, his pulse 90 and small, his tongue white, but his appetite unimpaired. Dr Forbes observing that he picked his nose frequently, was led to suppose he had worms. Calomel and other purgatives were therefore prescribed, and his belly was fomented, by which he was somewhat relieved, and voided a large Lumbricus worm. His belly, however, still continued to be tense, and painful

when pressed; his body very irregular. No enlargement of any of the bowels was perceived.

On the 13th, he was seized with more acute pain, and passed involuntarily several green stools, and what he vomited was of the same colour. His pulse then increased to 140 in a minute, and his tongue was white.

Ten ounces of blood were immediately taken from the arm; he was put into a warm bath, six grains of calomel were given to him, and a large blister was applied to the Abdomen. He passed a very restless night, and had several involuntary stools, of a light green colour, mixed with a white curdled matter. He then discharged another worm. For several days he was somewhat easier, though his pulse was not lower than 100 in a minute.

On the 17th, his stools were more of a natural colour, but accompanied with considerable griping.

On the evening of the 24th, his pulse was only 94, but irregular, and his tongue white and dry, his countenance much flushed, and he became delirious. A blister was applied to the belly, and half an ounce of Glauber's Salt was given in gruel, which procured a copious stool. He continued nearly in the same state till the 28th, his countenance was then expressive of much anxiety, his breath fœtid, and in what he passed by stool, there was but little natural fæces. Besides delirium, he now had also subsultus tendinum.

On the 30th, he slept occasionally, and had eva-

cuations, which were somewhat of a dark-green colour: pulse 150; mouth clammy: he had an inclination to vomit, and was at times delirious. The calomel was repeated, and a blister applied to his head. In the course of a few days, a considerable quantity of well formed pus issued from the Navel, from which a probe could be passed downwards for three or four inches. The Abdomen was extremely hard, and did not yield to pressure. Hectic Fever followed, and the pulse was commonly upwards of 140 in a minute, and weak. The stools fœtid, and involuntary (which they had indeed been during the greater part of his illness), attended with most excruciating pain as they passed per anum. As the purulent matter continued to discharge, the pulse was less frequent, and his appetite began to improve. He had a craving for animal food, which was allowed him with wine daily. He, notwithstanding of this, became weaker every day, his breathing became laborious, and he at last was convulsed, and perfectly insensible. On the morning of the 17th, about eight o'clock, he died.

The Dissection was performed by Mr Fyfe, in presence of Drs Rutherford, Forbes, Smith, and myself.

Upon introducing a probe through the fistulous opening, at the Navel, it passed downwards for about four inches.

Upon cutting upon the probe, about a table-spoonful of purulent matter, which had been lodged be-

tween the Abdominal Muscles, and the Peritoneum, about half way between the Navel and Pubis, was discharged.

Upon turning the probe in various directions, it readily passed towards the Spine from the Fistula, between the convolutions of the Intestines.

Upon removing the Abdominal Muscles, the Peritoneum lining these was found to be much thicker than usual, and to have formed adhesions with the Omentum. The convolutions of the Ilium were of a leaden colour.

Upon raising the Peritoneum, various passages were found in different directions between the adhering Intestines. While Mr Fyfe was dividing the Parietes of the Abdomen on the left side, and a little nearer to the anterior Spinous process of the Ilium, than under the Abdominal Aperture, he cut through a preternatural Canal, formed by Coagulable Lymph, of about the eighth of an inch in diameter.

This preternatural passage, readily admitted the point of the fore-finger, and was filled by a quantity of a yellowish fluid, very much resembling bile.

Dr Rutherford supposed, that it probably had some communicatiou with the Liver.

This preternatural Canal stretched upwards over the left Psoas Muscle, and over the left Kidney, even to its uppermost part.

The Psoas Muscle, situated behind the preternatural Canal, was in a sound state, as also the Dorsal

and Lumbar Vertebræ, and the ligamentous sheath which covers them.

When the largest and uppermost end of this preternatural Canal was fully exposed to view, it was found that the Jejunum opened into it; and in the Jejunum, there was precisely the same kind of matter, as in the under part of the preternatural Canal.

There were two distinct bands of Coagulable Lymph, which extending across the ruptured end of the Jejunum, divided its orifice into three distinct, though unequal parts.

The whole of the Intestines was of a leaden colour, and bore evident marks of Peritoneal Inflammation, the convolutions of the Ilium being very firmly united to each other, by short and numerous adhesions.

The Sigmoid flexure of the Colon and the Rectum were considerably contracted, and their Coats felt thicker, and more fleshy than usual; whereas, the great arch of the Colon was much distended by air, and had attained a preternatural size.

Upon opening the Intestines, it was ascertained, that the Inflammation had not been confined to the Peritoneal Coat; for in several places, there were spots of the size of a shilling, of a dark-red colour on the Villous Coat, which colour was owing to the small branches of blood-vessels distributed upon that Coat being gorged with blood.

The other viscera of the Abdomen, and also those of the Thorax, and the Brain were in a sound state.

The preceding case seems to me to afford a very striking example of Inflammation of the Intestines, followed by suppuration and Rupture of the Intestine.

In consequence of the ruptured Jejunum being surrounded by a sheath of Coagulable Lymph, life was not extinguished so soon as the rupture took place.

Even considerable portions of the Intestinal Canal have been discharged by stool, after an Intussusceptio, and yet the patient has recovered.

SECTION XXX.

Of the Organic diseases of the Mucous Glands of the Alimentary Canal.

The Mucous Glands of the Alimentary Canal are, in my opinion, the primary seat of Scirrhus, and, therefore, I have introduced in this place my observations on Scirrhus and Cancer of the Alimentary Canal.

Before entering into detail respecting Scirrhus and Cancer of the Alimentary Canal, it may not be improper to premise some general observations on the subject.

This is a disease of advanced life, which I have never seen before puberty, and is more prevalent among men than women.

This organic disease is most frequent in those parts

of the Alimentary Canal where the Mucous Glands are most abundant, as at the Cardia, Pylorus, Caput Cæcum Coli, and Rectum, but it is not limited to such situations; for occasionally, it has been observed in every part of the Alimentary Canal.

By this disease, the Alimentary Canal is more or less contracted, and in a few cases, totally obstructed.

The part affected by Scirrhus has a contracted and irregular form, when pressed, feels hard and heavy, and generally adheres to the neighbouring parts. The Scirrhus is generally limited to one part of the Gullet or Stomach, or Intestines, but sometimes it pervades the greater share of these organs. Vid. Plates IX. and X.

From having examined many specimens of this organic disease, I am induced to believe, that the disease takes its origin in the Mucous Glands, in the form of small little hard knots, some of which do not exceed a pin's head in size. Some of these Glands rapidly become larger, and push inwardly upon the Villous Coat.

The disease is propagated from the Mucous Glands to the Cellular substance, which intervenes between the Coats of the affected part, which attains an unnatural thickness and hardness, being converted into a dense, tough, yellow substance, like the white in the skin of the orange, through which fibres of a cartilaginous appearance pass in different directions.

The Peritoneal Coat attains an unnatural hard-

ness, and resembles the coarser kinds of parchment, and in some cases, acquires the transparency of horn; in others, it attains an unnatural thickness.

The muscular fibres of the Muscular Coat are seldom to be seen, and when visible, are generally of a paler colour than natural, and are separated from each other by Cartilaginous Septa of different thicknesses in different cases.

The Valvulæ Conniventes at the seat of the disease are much thickened and enlarged, and frequently a number of Tumours grow from it towards the cavity of the Stomach, as in Plate X.

In many cases, the disease is slow in its progress, and a considerable time elapses before the Scirrhous Tumours have attained so considerable a bulk, as to obstruct the passage of the food. But in other cases, the progress of the disease is much more rapid, which may perhaps depend upon the greater or less irritation to which the diseased part is exposed.

In many cases of Scirrhus, the adhesive precedes the ulcerative process; thus life is maintained, though the Coats of the bowel, which has been primarily diseased, be destroyed by ulceration: thus, for example, the Stomach adheres to the Liver before, and to the Pancreas behind.

If Scirrhus be so situated as to interrupt the passage through the Alimentary Canal, as at the Cardia or Pylorus, the part above the Stricture becomes prodigiously enlarged, and its Coats are at first much

thickened, but after a time they become thinner, and even ulcerated, and at length ruptured, by which an unnatural communication is established between the seat of the disease and the neighbouring parts. There is in some constitutions so great a tendency to Scirrhus, that the disease which had begun in the more glandular parts of the Intestines extends itself to neighbouring parts, as from the Cardia and Pylorus to the Stomach, or from the Cardia to the Diaphragm, or from one bowel to another, or from the Stomach to the Liver.

There is some variety as to the appearance of the diseased part.

There is much variety as to the thickness, also as to the proportion of Cartilage in the diseased part, and also in the appearance of the Tumours which grow inwardly.

I shall describe these varieties as they occur in the Stomach.

1st, We observe an universal and unnatural thickening and hardness of the Coats of the Stomach, and sometimes only at and in the vicinity of the Pylorus, which somewhat resembles the Os Uteri, and the thickness is on some occasions much greater on one side of the Pylorus than the other, hence the passage through the Pylorus is not direct, the thickened portions acting somewhat like valves, and obstructing the passage very much.

2d, The Villous Coat has sometimes been studded

over by a number of processes of a Cartilaginous consistence.

The Coats of the Stomach become rather thinner than in the healthy state, but acquire such a degree of hardness, as to resemble Cartilage.

In the 3d variety, there are one or more circumscribed Tumours of a rounded form, growing from the Villous Coat of the Stomach, which, in some cases, attain the size of a small orange, and which, when divided, exhibit the genuine Scirrhous Structure.

Dr BAILLIE has very accurately described these Tumours in the following words: (Vid. Morbid Anat. 2d Edition, p. 144.)

"I have seen several instances of a Scirrhous Tumour being formed in the Stomach, about the size of a walnut, while every other part of it was healthy. This Tumour has most frequently a small depression near the middle of its surface. While it remains free from irritation, the functions of the Stomach are probably very little affected by it; when, however, it is irritated, it must occasion very considerable disorder in the functions of the Stomach, and perhaps lay the foundation of a fatal disease."

The Scirrhous part becomes softer and ulcerated in the centre; and, lastly, there is a fungous growth from the ulcer, which has ragged, unequal, and retorted edges; the ulcer is then said to be in a Cancerous state.

The neighbouring Lymphatic Glands are generally also Scirrhous or Cancerous.

Of Scirrhus and Cancer in the Gullet.

Scirrhus is generally limited to the Cardia, which Dr Hunter has imputed to the peculiar arrangement of Muscular fibres at the Cardia, with which it does not appear to me to have the smallest connection, being rather referrible to the greater number of Glands in that part of the Gullet.

But the Scirrhus sometimes pervades every part of the Gullet, as in Plate IX. Ulceration frequently takes place above the seat of the disease, after it has lasted for some time; thus, an unnatural communication is sometimes established between the Gullet and the Trachea, which proves fatal. Vid. Plate IX.

Scirrhus and Cancer, beginning in the parts in the neighbourhood of the Gullet, sometimes extend to it, or are propagated from the Gullet to the neighbouring organs.

I had occasion to visit an old Lady, whose under Lip, Uvula, and Pharynx had been reduced to a Scirrhous state.

The Scirrhus, which had begun in the Gullet, sometimes extends to the neighbouring Viscera, as in Plate X., which was taken from the body of a woman who died from Scirrhus of the Cardia, which had extended to the Diaphragm, and to the Stomach.

The following appearances were discovered on dissection.

The Gullet was preternaturally enlarged, thickened, and harder, and for the space of an inch, was so much contracted, as scarcely to receive a goose's quill.

Three Scirrhous masses about the size of olives, imbedded in the Cellular substance between the Coats of the Stomach, had occasioned the Stricture. Vid. Plate X. There had existed in the constitution of this patient a strong tendency to Cancer, for the Cardia, smaller curvature of the Stomach, Diaphragm, Pancreas, and Uterus, were similarly diseased.

The two Nerves composing the Par Vagum, were larger than usual, and flattened, where they passed over the Scirrhous masses at the Cardia.

The Dorsal Vertebræ and Intervertebral Cartilages, in the more inveterate cases of this disease, have been sometimes also thrown into a diseased state.

Of the Symptoms.

Pain, and an inability to swallow solids, are the earlier symptoms of this disease, and after a time, even fluids are arrested in their course downwards; they remain for a short time in the Gullet, and distend it, thereby creating a sense of suffocation, until the contents are rejected, by an inverted action of the Gullet, through the nose and mouth, by which the patient is much relieved, and the remainder passes down with a guggling noise, like water flowing through a contracted passage.

The following case, communicated to me by Dr Home, gives a good idea of the effects of Scirrhus in the under part of the Gullet.

The complaint began in the 5th month of pregnancy, by a slight pain in the Epigastric region, and distention of the Stomach.

A few days after delivery, the patient was seized with a difficulty in swallowing. In a few months, she could swallow nothing but liquids, or bread soped in milk, or water, and not without a considerable effort. What she attempted to swallow, passed no farther down than the middle of the chest, where she felt it stop; sometimes it remained in that situation only for a few minutes, at other times it stuck there for many hours; the greater part of it was then rejected by an inverted action of the Œsophagus, and sometimes even the small quantity of food which reached the Stomach, was rejected by vomiting.

When she lay on her back, or in any other posture, except half-inclined to the right side, she experienced the same sensations in her bowels as a person does whose limb is asleep; these sensations left her when she assumed any other position.

In that miserable state, she lived for four or five months, and at last was unable to force any thing beyond the Pharynx; and her death seemed to have been the effect of inanition.

She became, a few days before her death, so weak, as to be unable to speak for any time without being exhausted.

Her body, as might have been expected, from the small quantity of food she could swallow, was much bound.

A probang passed readily to the middle part of the Gullet, but no farther.

The preceding symptoms led to the suspicion of stricture in the Gullet, and the examination of the body after death, shewed that those suspicions were well founded *.

Some patients afflicted by this disease, swallow with much greater difficulty at particular times, and suffer much from what they call a constriction in the Throat, which gives the sensation of suffocation, which possibly may be owing to the Spasmodic being combined with the Organic Stricture, and there are some who are thrown into convulsions during the effort of swallowing.

Towards the termination of the disease, Pus is rejected along with the contents of the Gullet.

Of Scirrhus and Cancer of the Stomach.

Scirrhus and Cancer are more frequent in the Stomach than in the Gullet.

The capacity of the Stomach is commonly much diminished by a Scirrhus affecting the body of this organ, the Coats being much thickened, and the

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* Vid. Plate X.

growth being inwardly. I measured the quantity of water such a Stomach would hold, and found that it was capable of containing little more than four ounces of water.

But in some cases of this description, the Stomach attains an unnatural size, of which a remarkable specimen is preserved in the Museum of Edinburgh, where the Stomach filled the greater share of the cavity of the Abdomen.

The Pylorus is a more frequent seat of Cancer, than the body of the Stomach or Cardia: and by obstructing the progress of the Aliment, occasions an enlargement of the Stomach, which on account of its unnatural size and weight, when filled, descends in many cases lower than in the healthy state, in some cases, preserving its transverse situation in the Abdomen, but in others, the Cardia retains its natural situation, whilst the Pylorus sinks as low as the Navel, and may be distinguished there during the life of the patient: and when in that unnatural situation, has been, on account of its hardness and mobility, mistaken for a Concretion within the Intestines, for a Tumour in the Omentum, or for an enlarged Mesenteric Gland.

A very offensive air, and a quantity of a dark-brown or black fluid, adds much to the distention of the Stomach.

The Lymphatic Glands in the smaller curvature of the Stomach are commonly considerably indurated.

Symptoms of Scirrhous Pylorus.

The symptoms of Scirrhous Pylorus may be divided into three stages.

Those of the first stage are indigestion, acidity of Stomach, sense of weight, oppression, and constant pain in the organ, nausea, and occasional vomiting about a couple of hours after meals.

The patient's body is alternately loose and constipated, and he becomes somewhat emaciated.

Occasional dozes of Ipecacuanha, followed by bitters, afford relief.

The symptoms of the second stage, are, sallow complexion, sunk eyes, manifest emaciation of the whole body, disturbed sleep, great acidity, and occasional spasms of the Stomach, frequent nausea and vomiting, and the contents of the Stomach are mixed with a viscid sour mucus, and the food on some occasions is rejected, almost unchanged. These symptoms are attended by feeble quick pulse, which ranges between 90 and 110 in the minute, and by very fœtid black stools.

The swelled and indurated Pylorus may frequently be perceived by an external examination, and more especially when it has descended lower than usual, which frequently happens.

When the Pylorus has been much contracted, the food passes readily into the Stomach without occasioning pain, but being retained within the Stomach

for a considerable time, that organ becomes much distended, and an evident fluctuation of its contents may be perceived, which is succeeded by vomiting.

Some patients also suffer more when they lie upon the left than upon the right side.

The following symptoms render it probable, that the disease has arrived at the third, or ulcerated stage.

Hectic fever, great anxiety, excruciating burning pain in the region of the Stomach much increased on taking food. The matter discharged by vomiting has a very offensive smell, and of a brown-black colour, like coffee-grounds. This brown colour is owing to an admixture of blood, which is derived from the small blood-vessels of the Villous Coat of the Stomach, which have been eroded by the Cancerous Ulceration.

In other cases, large quantities of coagulated blood and pieces of membrane have been thrown up, probably from some large vessel being eroded; as the disease generally proves fatal before it has extended so far as to erode any of the larger blood-vessels.

The repetition of the bleeding exhausting the patient's strength, hastens the fatal termination of the disease.

The larger blood-vessels have sometimes been eroded, and so great a quantity of blood has been lost in a short time, as proved fatal.

The following Case affords a good illustration of the preceding remarks.

A man, 57 years of age, who had been for many years subject to Stomach complaints, fell down in a state of insensibility.

Upon his recovery, he discharged, by vomiting, a quantity of blood, and continued to do so for some weeks, and also passed some clots of blood by stool.

In about six months, the vomiting returned, and with increased severity; and at last the patient, after having suffered in the course of one night six successive fainting-fits, followed by vomiting of blood, expired suddenly. On examining his body, several coagula of blood were found within the Stomach, and about 2 lbs. of fluid blood.

The orifice, or orifices, from which the blood had been discharged, could not be discovered.

An extensive Cancerous Ulcer occupied the whole of the left Sac of the Stomach.

Owing to the small quantity of food which passes the Pylorus, the discharge by stool is very trifling, and somewhat resembles the meconium of infants.

Clysters are generally required to procure a passage, and in some cases, even the most acrid purgatives.

After the disease has arrived at its third stage, every kind of food except milk, gruel, soups, jelly, or sago, aggravates the very acute pain in the Stomach.

The patient loses his flesh daily, languishes, sleeps ill, and becomes very weak.

The vomiting generally ceases a few days before the patient's death.

The pulse, towards the conclusion of the disease, is generally from 96 to 100, or 110, and very weak and small.

There is much variety as to the progress of this disease, and also as to the pain the patient suffers*, for to some it proves fatal in a few months, whilst others have lingered under it for many years.

The Stomach has sometimes burst in consequence of a Scirrhus of the Pylorus.

As the following case, written by Mr TYTLER, Surgeon, to my Father, conveys a very impressive and correct idea of the nature, progress, and consequences of Scirrhus of the Pylorus, I have inserted it in the words of its author.

"*August* 18*th* 1781.

"J. B ætat. 58, of a thin spare habit, and tender constitution. Ever since he remembers, has been distressed with the heartburn, and of late years, this has been accompanied with excruciating pains in his bowels, borborygmi, acid eructations, costiveness, and indigestion. An acrid fluid, colourless and thin as water, frequently runs from his Stomach for hours together, and never fails to increase his com-

* It was very remarkable in the case communicated to me by Dr KEITH, Vid. pages 225, &c. where this disease was combined by a spasm of the Gullet, how little pain the patient suffered, until within two or three weeks of his death.

plaints. This symptom is of a long standing, and generally accompanied with an increase of costiveness. Is often troubled with a voracious appetite, and irresistible longing for particular kinds of food, which he knows he cannot digest, yet never fails to eat in large quantity when they come in his way: for he not only has a pleasure in eating, but in looking at them. Such as salt and smoke-dried salmon, hams of all kinds, dried fish, rich sauces, melted butter, &c. Has, for many years past, abstained from vegetables, which never fail to increase his heartburn, and pains in his bowels, even though taken in very small quantity. About two months ago, his symptoms, suddenly became more violent, without a cause, the discharge of water from his Stomach by the mouth, became perpetual, and continues so, insomuch, that a large bason is filled by it once in twenty-four hours, and he gets very little rest in the night. This liquor is of so acrid a nature, that his lips, palate, throat, and probably the Œsophagus, are swelled and ulcerated. At the same time, he is distressed with frequent vomiting, excessive thirst, and his costiveness so much increased, that very large doses of the Tinct. Sacr (his favourite purgative), have no effect; but has taken several doses of salts, which generally abate his symptoms for a few days.

"He has consulted many Physicians, and used all sorts of bitters, and almost every kind of stomachic medicine, but without any relief, except

from frequent vomits, and the use of Tinct. Sacr. both of which procured him long intervals of ease for a number of years. What he throws up at present is exceedingly acid, and so hot, that during the operation of the vomit, he feels as if a live coal were in his breast. Has no symptomatic headache, nor ever remembers to have had any. Pulse weak, but slow and regular.

"In summer 1779, after a severe paroxysm of his disorder, he was suddenly seized with a vomiting of thick dark-coloured matter, resembling coffee grounds, which continued about twenty minutes, accompanied by great prostration of strength, paleness of the face, &c. But these symptoms soon left him after the vomiting ceased, and next day, I ordered him a dose of salts and manna, which brought off a considerable quantity of the same dark-coloured matter, and after that his complaints abated for several months.

"August 20.—After a severe paroxysm of his Stomachic disorder, he fainted when walking in the fields, and immediately threw up a large quantity of the same dark coloured matter he had vomited two years before. Being a little recovered, he walked into the house with great difficulty, and immediately went to bed. Continued very weak and feverish all day, and at night took of laudanum, gutt. xx. which seemed at first to give him some relief; but about midnight, the vomiting returned with much greater violence than at first, insomuch, that he lay for some

time without sense or motion, was so weak as to be unable to rise, or even turn himself in bed after he recovered from the faint, and could take no sort of nourishment. At the same time, the pains in his bowels were most excruciating, and the discharge of clear matter from his mouth perpetual.

" 27th.—Has taken a dose of Glaubers salt and manna, almost every day since the black vomiting, and discharged great quantities of the same matter by stool, with little relief to the pain in his bowels. He is still tormented with the heartburn, accompanied by excessive thirst, and after eating, is not easy till he throw up his victuals again ; nevertheless, his appetite still continues. An œdematous swelling of his legs has appeared for some days past. Let them be rubbed evening and morning with a flesh-brush, and wrapt in flannel all night. He refuses to take any medicine except the physic.

" September 1.—Finds himself easier to-day. The vomiting not so frequent, and his thirst a little abated. Œdematous swelling going off.

" To save repetition, it may be observed here, once for all, that the discharge of clear matter, and the vomiting never left him a single day (though sometimes better and worse), from August 18th to the time of his death, which happened the 28th of December following. Some days, in the forenoon, the watery discharge would stop altogether, but about an hour after dinner, it began with great violence, and he cried incessantly from the pain in his bowels.

In a little while after, the vomiting came on, and continued with very short intervals till bed-time; and for the last five or six weeks, scarce ever left him, night or day: But what ease he had was always in the forenoon. From the beginning of September, the vomiting was always of a blackish-brown colour, as if more of the dark-coloured matter had been lodged in his Stomach, except when he threw up his food, immediately after eating, which frequently happened. And he used to wonder from whence the great quantity of matter thrown up could come, as it seemed greatly to exceed the quantity of what he eat and drank.

"4th.—Three nights ago, took at least two ounces of Tincture of Rhubarb, and one ounce in the morning, without any effect, till a stool was procured by a repetition of the clyster. Last night took three pills, and without effect. Has taken several times of the Infus. Columb. which increases the pain in his bowels. Vomiting and thirst abated. Uses milk and water for his drink. Repetat. Enem. v.

"℞ Tartar. Solubil. ℥i. solve in Aq. Font. ℥iii. Cinnam. s. v. ℥iss. adde Syr. Zingiber ℥ss. M. Sig. Capiat dimidium hor. 7t. m. et cæter. h. 11ma. ante merid. nisi prius; Solutio Alvi superveniat.

"6th.—The running of water from his Stomach considerably increased, and the burning pain in his breast very severe. Cannot swallow the mildest liquid without much uneasiness, and the taking the Laxative Solution occasioned a most excruciating

pain. However, it operated well after the second dose. Has given up the Columbo Infusion for some days, but his Stomach seems worse since then. Let him have it in smaller doses, and more frequently repeated. Swelling of the legs almost gone.

"21st.—For the last fortnight has been better and worse, but on the whole is more emaciated, and visibly declining, yet he generally walks out in the forenoon when the weather is good, and sometimes rides on horseback, but is commonly obliged to keep his bed after dinner. Has entirely given over his medicines; complains that the Columbo gives him gripes, even in the smallest doses, and that the Tart. Solubil. never operates without an injection afterwards.

"His costiveness increased so much, that after the beginning of October, no purgative whatever had the least impression on him, and it was found necessary to give him an injection every night, which invariably produced a stool about half an hour after it was administered. Many laxatives were tried: Ol. Ricin. to the quantity of ℥iv. per diem, purging salts of every kind, tinctures, and at last strong stimulants, all to no purpose. He continued to crawl out of doors till the first week of December, but as he had by that time entirely lost his appetite, it is scarce possible to conceive to what a skeleton he was reduced. He now gave up all sorts of medicines, kept his bed constantly, and at times spoke with difficulty. I had not seen him for a fortnight, when on the night of

the 27th, I was called in a hurry. I found him in the last degree of weakness, but constantly racked with the most excruciating pain, making repeated attempts to vomit, but nothing came up. I was informed he had got an injection about ten at night, which operated as usual, and he drank a bowl of sack whey afterwards. On a sudden, the pain of his bowels increased to the last degree of torture, and, though he had the most violent retching, never threw up again. In about a quarter of an hour after my arrival, he became delirious, and his speech inarticulate; but every now and then making signs to be lifted up that he might try to vomit. Thus, he continued all night, and expired about nine in the morning.

" Next day, his body was opened by Mr Carson at Forfar, and myself. The Pelvis was quite full of a thin dark-coloured liquor, which likewise overspread the Intestines, insomuch, that we filled a large basin with it, to the quantity of about two Scots pints. The acid smell was intolerable. The bottom of the Stomach was full of the blackish matter he had vomited formerly: a considerable degree of inflammation and scirrhosity appeared about the Pylorus; on the anterior part was a small hole, perfectly circular, and on the outside of the posterior were a number of black Tubercles. Having but little time, we made no particular remarks on any other viscus. The Intestines were considerably inflamed, and almost quite empty. We supposed that the Stomach had burst

after drinking the sack whey, when the violent pain came on, and that its contents had then been discharged into the cavity of the Intestines."

As a corollary to the preceding case, I have subjoined the following case, communicated to me by Mr A. Burns of Glasgow, with remarks upon it by its Author, as it tends to illustrate the effects of an unnatural communication being established between the Stomach and Colon, and also that a pulsation is sometimes communicated to such diseased Stomach from the subjacent arteries.

"The patient, a middle-aged male, had, during many months, gradually declined, and had been much tormented with violent pulsation in the Epigastrium, where a very considerable-sized Tumour was perceptible. On opening the body, I found that the Tumour which had occasioned the beating, arose from a diseased state of the Stomach and Colon. They were both matted together, considerably thickened, and very much indurated. The adhesion of the one to the other extended along the line of the great curvature of the Stomach. The Omentum was necessarily involved. The side of the Stomach, Colon, and Omentum, formed a Tumour about the size of a large Orange, and of a solid consistence. The morbid parts lay over the root of the Cæliac Artery, attached also to the inferior Mesenteric vessel. It was from the impulse of these, and from the communication of action from the Aorta, that the

apparent pulsation proceeded. The arterial system was healthy, but the heart and vessels were very small.

" Near to the pyloric extremity of the Stomach, the Coats of that viscus, and of the Colon, were ulcerated, so that a large opening led from the one into the other: The aperture was about three inches in diameter. It was surrounded by thickened and indurated margins. The whole diameter of the Colon was very much diseased. It was thickened, indurated, and ulcerated. The ulcerated surface was mottled, and covered by a very fœtid sanies; and from the interstices, dark purple shreds of diseased cellular membrane depended. The ulcer had a most unhealthy look, yet it did not prevent the true characters of Carcinoma. It was an ulcer which is not rare in the Stomach, but it does not seem to be accurately distinguished from cancer of that viscus. The Pylorus was somewhat thickened, but shewed no Carcinomatous bends when cut. The opening from the Stomach into the Duodenum was large enough to allow the thumb to pass with ease. The small Intestines were healthy, and quite empty. The lower part of the Colon and the Rectum contained some purulent matter.

" This case I consider valuable. In Scirrhous Pylorus, few patients escape most distressing vomiting. In these, however, dissection has shewn a reduction of the opening, leading from the Stomach into the

bowels. In the present patient, there was no vomiting, a circumstance which may have arisen from the ready passage of the food from the Stomach into the Colon. I do not believe that much could pass through the Pylorus, because, on the contraction of the fibres of the Stomach, the food would escape with more facility by the ulcerated opening into the Colon, than it could by the Pylorus. The latter is provided with a sphincter muscle, the action of which could never be overcome as long as a free outlet remained for the food through an opening not defended by a muscle. That little really passed by the Pylorus, is clearly proved, by the empty condition of the whole track of the small Intestines. We cannot wonder, that in this patient, the emaciation and debility were extreme. Independently of the effects of the Ulcerous secretion in weakening the body, little nutrient matter could be absorbed from the lower part of the Colon and the Rectum, into which, however, the chief part of the contents of the Stomach was directly sent.

" This case, besides adding another to the numerous examples already collected of apparent aneurism arising from other causes than disease of the arteries, also shews how extremely the Stomach may be disorganized without vomiting being occasioned, and it leaves it doubtful whether the vomiting, which usually accompanies Scirrhous Pylorus, be not produced by the mere obstruction to the transmission of the food from the Stomach into the bowels.

"If the above case, and the few remarks, can be usefully employed by you, print them if you please, and believe me, your's truly,

"ALLAN BURNS."

"*Glasgow, June 5.* 1811."

Of Scirrhus and Cancer of the Intestines.

The larger Intestines, and especially the head of the Colon, and the Rectum, become more frequently Scirrhous than the smaller.

The appearances on dissection are very similar to those which are observed in the Stomach.

The parietes of the Intestine become thicker and harder. I have seen the Coats an inch in thickness.

There are two preparations in the Museum of Edinburgh, which exhibit a variety of Cancer of the Intestines, which I believe is very rare, and has not been described. About a foot of the internal surface of the Ileum is studded over by distinct Tumours, of a dark-brown colour, inclining to purple, which are about half an inch thick, and which seem to be very soft, and every part of the surface of these Tumours is perforated by small holes, which are disposed at equal distances from each other, and of an uniform size.

The Intestines above the stricture are generally considerably dilated, and sometimes into a kind of pouch, the Coats of which are thinner than other parts of the dilated Intestines. Ulceration takes

place in the diseased Coats of the Intestines, and in the Tumour or Tumours growing from these, and one large cancerous Ulcer is thus formed. From the continuance of the Ulceration, unnatural communications take place, as between the Arch of the Colon and Stomach; between the different turns of the Intestines; between the Rectum and Bladder of the Male, or between the Rectum Vagina and Bladder of the Female, so that the fæces and urine are discharged by one common Orifice.

Symptoms of Scirrhus and Cancer of the Intestines.

There is reason to apprehend that a portion of the Intestinal Canal has been reduced to a Scirrhous state, when very acute lancinating pain is felt by a patient, who is considerably advanced in life, for a long time at a particular part of the belly; when air passes with a hissing sound and tremulous motion at that part, and a Tumour is perceived at the same place, which is painful on pressure.

In some cases, by carefully examining the quantity of liquor which may be thrown up from the Anus, a probable conjecture may be formed of the seat of the disease.

But generally, it is by no means easy to determine by the symptoms in what particular part of the Intestinal Canal the disease is seated, unless it is within the reach of the finger, or an instrument.

The disease generally comes on in a slow, and al-

most imperceptible manner, and makes for some time but little progress.

The patient has at first more frequent calls to go to stool than usual, so that the earlier symptoms of the disease may be mistaken for Diarrhœa: he has also some difficulty and pain in passing his fæces, which are of a thin consistence: hence the disease may be mistaken for Colic, or Dysentery.

By the use of small doses of Ipecacuanha and Columbo Root, the more urgent symptoms are sometimes removed for a time, and the appetite, which had been much impaired, returns, so that the patient considers himself quite well. The relief is however but temporary; the patient again loses his appetite, has acidity of Stomach, Colicky pains, more frequent calls to go to stool, and the fæces are passed only after considerable straining.

The above symptoms are attended by accumulation of wind in the bowels, which may be heard passing from one bowel to another.

The fæces, which are discharged only in small quantities at a time, are of thinner consistence than natural, and mixed with a frothy slimy mucus, or with blood.

The patient becomes much emaciated, and when the disease has been of some duration, a Tumour may be perceived by an external examination, which, when pressed, is painful.

The pulse at this period of the disease becomes quicker than natural.

The Intestine becomes daily more constricted, so that only a small quantity of fæces is discharged. A total suppression comes on, which is soon followed by swelling of the belly, considerable distention of the Intestines, and very acute pain.

The pain and distention increase, and are followed by occasional vomiting, which becomes more and more frequent.

Every medicine that is swallowed excites vomiting.

Inflammation follows, unless a copious stool can be procured.

A slimy mucus, tinged with bile, which is discharged, induces the friends of the patient to expect a recovery.

In some cases, clysters have been vomited in a few minutes after they have been injected, which affords a presumption of an unnatural communication between the Arch of the Colon and the Stomach.

Scirrhous Rectum.

The diseased Rectum is sometimes surrounded by Scirrhous Tumours, which in some cases communicate with the cavity of the Intestine by small holes, and from the continuance and propagation of the Ulceration, the Tumours which are external to the Rectum, form, with the diseased Coats of that bowel, a large cancerous Ulcer. The Scirrhous Rectum generally contracts adhesions with the neigh-

bouring parts, and very frequently is closely bound down to the Os Sacrum.

Symptoms of the Scirrhous Rectum.

The first symptoms of the disease are pain, or difficulty in making water. The above symptoms are owing to the great degree of sympathy which exists betwixt neighbouring viscera, and also to the preternatural adhesion betwixt the Bladder of Urine and Rectum.

Every kind of exercise, especially walking or riding, creates much uneasiness.

The patient has frequent calls, and great difficulty in passing his fæces, and suffers uneasiness, often considerable pain during the effort, and the fæces are neither of the usual size nor consistence. In some cases, liquid stools only are passed, and involuntarily, owing to the Sphincter Ani being diseased.

A considerable quantity of ropy mucus, with an admixture of ichorous or purulent matter, is generally discharged along with the fæces; and during the effort of passing the Pus, the patient suffers the greatest torture.

Upon introducing the finger within the Rectum, there is often much difficulty in passing it upwards, on account of the Tumours which have been already described.

The Scirrhous Rectum generally terminates fatally by the suppression of the natural evacuation

by stool, and sometimes, though very rarely, by Tympanites and Peritoneal Inflammation.

If the obstruction proceeds from Scirrhous Rectum, even a brisk Cathartic does not always empty the contents of the Rectum, whereas, when the obstruction proceeds from hardened fæces, the Cathartic produces a plentiful discharge, which affords the patient much relief.

When the Rectum is Scirrhous, there is much difficulty in throwing up a Clyster, and when administered by an unskilful person, it does not pass upwards; but if it does pass the stricture, it is retained longer than usual, and comes away in small quantities.

The nature of the disease may frequently be discovered by introducing the finger into the Anus; but the practitioner ought to be on his guard, lest he shall mistake for a Scirrhous Rectum an enlarged Prostate Gland, or Cancerous Uterus.

The symptoms occasioned by Scirrhous Rectum and Piles, being somewhat similar, it may not be improper to add, that the Rectum more commonly becomes Scirrhous about two or three inches from the Anus, and in its whole circumference, and hence the fæces, which are not of their usual form, are discharged with much pain and difficulty.

Whereas the distress from Piles is only very severe whilst the Tumours are protruded externally and compressed by the Sphincter Ani. In other

circumstances, the patient's sufferings are inconsiderable.

Beside Piles have generally narrow necks, whereas, both the Scirrhous Tumours growing from the Rectum, and also the Venereal Verrucæ, have a broad basis; and farther, the Verrucæ, which give little pain, not only grow from the Rectum, but also from the skin around the Anus.

EXPLANATION OF PLATE IX.

The drawing, from which this very highly finished engraving was taken, was copied from a very fine preparation of Cancer, which occupied the greater part of the Gullet, and is preserved in the Museum of Mr Heaviside of London.

A A, part of the Windpipe.

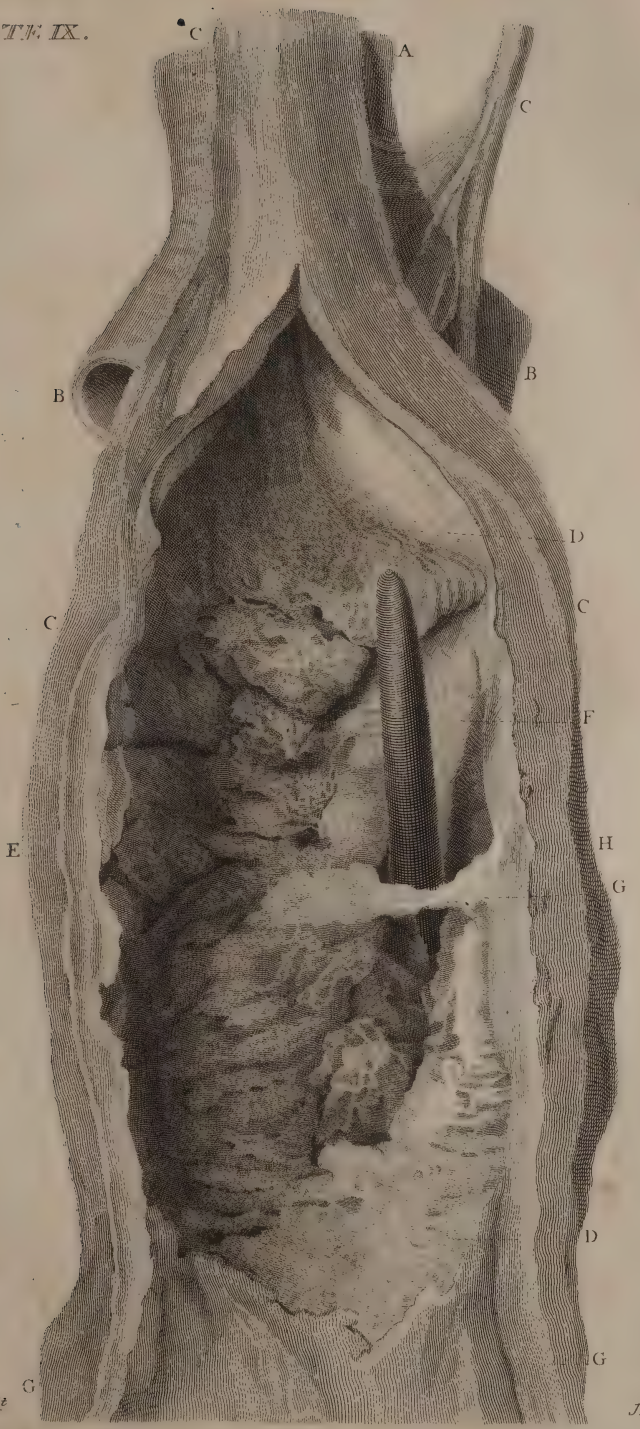
BB, The larger branches of the Windpipe, called by anatomists Bronchi.

CCC, The Gullet, the Coats of which are very much thickened, unequal, and ragged.

DD, Point out small ulcers upon the Villous Coat of the Gullet.

E, Opposite to this letter, the Gullet exhibits the genuine characters of Cancer, and a number of fungous excrescences, of different sizes, grew from the inner Membrane; and several of those next to the aperture through which the quill, F, has been passed, were in a state of ulceration.

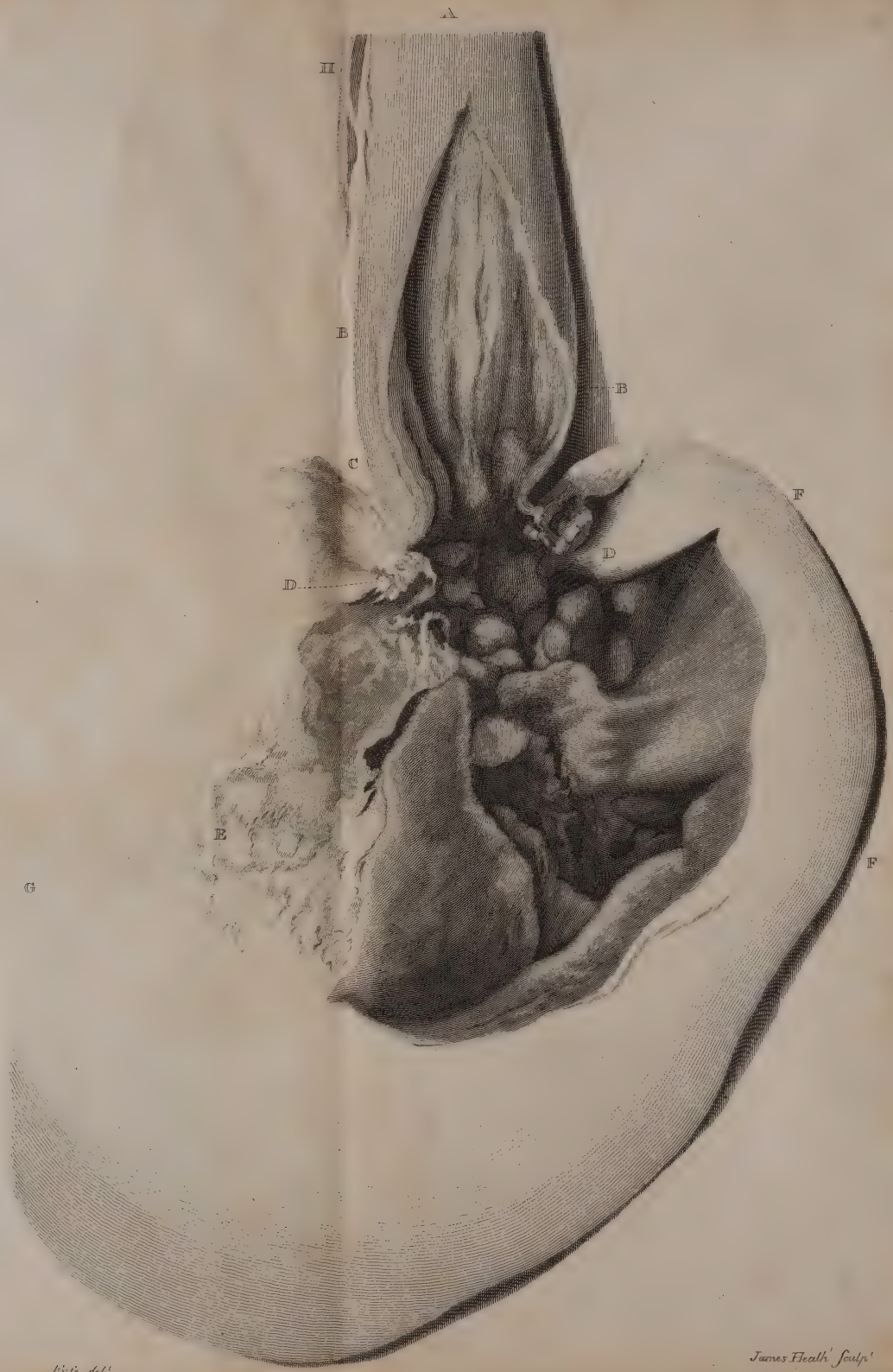
PLATE IX.



Clift del.t

J. Heath sculp.t

PLATE X.



Vizè del.

James Heath Sculp.

EXPLANATION OF PLATE X.

This engraving represents a Stricture occasioned by Cancerous Tumours at the Cardia, and also a Cancer of the Stomach, from the Villous Coat of which a number of Fungous Tumours grew. I received the preparation from Dr Home.

ABC, The Gullet opened; it was much dilated, and has fallen into folds.

The Tumours at the Cardia were about the size of small olives.

DD, Point out the Fungous Tumours within the great left Sac of the Stomach.

E, Represents slight ulceration, extending along the smaller curvature of the Stomach towards the Pylorus.

FF, The greater curvature of the Stomach.

H, The Par Vagum of the eighth pair of Nerves, which was much larger than is usual.

SECTION XXXI.

Of the Enlargement of the Mucous Glands of the Alimentary Canal.

It has been already observed, that in many of the organic diseases of the Alimentary Canal, the Mucous Glands are more or less affected.

There are also instances in which these Mucous Glands are much enlarged, and where there are no traces of any disease of the Coats; and this enlargement is stated to be attended by particular symptoms, which have been detailed at great length by Roederer and Wagler, in a treatise de Morbo Mucoso, who have very fully explained the analogy which they suppose to exist between the Morbus Mucosus, Intermittent Fever, and Dysentery.

Sometimes the Glandular Follicles have not only been enlarged, but also filled by a glutinous substance.

The symptoms attending this Morbid state, have been very ably described by Dr Stark, whose statement I have subjoined.

" A woman, aged 27, was, after an irregular intermittent, seized with severe purging, accompanied with excruciating pains of the bowels. What she voided was a thin olive-coloured fluid, with many small portions of a clear glutinous substance float-

ing in it; they somewhat resembled drops of oil: her pulse beat commonly about 90 in a minute, and was small; her tongue was commonly dry. No considerable remission having happened, she died in about six weeks after the purging began.

"A man aged 56, some months after a tedious fever, in which his strength had been greatly impaired, was seized with a purging, which, though sometimes violent, frequently remitted, but never wholly stopped. Pain of the bowels commonly preceded each fit of purging: what he voided, in the beginning, had been often mixed with blood, but afterwards it was mixed with small masses of a clear glutinous substance, coagulable by heat, or by alcohol, and sometimes it wholly consisted of that substance. Part of the food, especially liquids, passed through the body unaltered: his pulse beat about 90; his tongue was dry. The disorder was constant and violent for above a month before his death, which happened in eleven months after the purging began*."

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* Vid. STARK's Works, p. 5.

CHAPTER III.

OF OBSTRUCTION, ORIGINATING FROM A DISPLACEMENT OF A PORTION OF THE ALIMENTARY CANAL.

SECTION I.

Of Intus-Susceptio.

A PORTION of Intestine sometimes passes within another, carrying along with it its Mesentery; the Intestine is then in a state of Intus-Susceptio: and this proves a cause of considerable stricture, the included Intestine being in a contracted state.

It has been stated, that the Internal Coat of the Intestine is sometimes invaginated, and forms a complete barrier to the passage of the Alimentary Canal, but this I never have observed.

The Intestine passes generally into that immediately beneath it, and sometimes in the reverse manner.

The frequency of the first species may be readily explained from the natural peristaltic motion of the Intestines, whereas the latter can happen only when the peristaltic motion of the Intestine is inverted.

A part of the Intestine has been stated to fall within another, merely on account of its weight; but the case of Intus-Susceptio from below upwards, sufficiently refutes such a theory.

An Intus-Susceptio is not peculiar to any one period of life.

It is much more common during infancy than in manhood.

During infancy, the included portion of Intestine, may, in most instances, be readily disengaged, there being no unnatural thickening or inflammation, and but a slight diminution in the calibre of the Intestinal Canal.

But in the adult, the disease assumes a very different, and much more formidable aspect; the displaced Intestine is firmly fixed in its unnatural situation, in consequence of inflammation, swelling, and the accretion of parts; indeed, the union between the containing and contained parts, is in some cases so intimate, that the included Intestine cannot be withdrawn; nay, not even distinguished from the containing Intestine*, and there is at the same time a great contraction of the affected part.

In the infant, it is not uncommon to meet with three, four, or five Intus-Susceptions at the same time, sometimes there is a much greater number;

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* Vid. my Grandfather's Obs. on Intus-Susceptio. Edinb. Med. and Phys. Essays, Vol. II. art. 27.

and all in the natural direction: in other instances, some are in the contrary direction, but in full grown persons, such an appearance seldom presents itself.

The extent of the Intus-Susceptio, or of the quantity of Intestine received within the other, varies from one or two to eight, ten, nay, twenty inches *.

Intus-Susceptio is much more common in the smaller than in the larger Intestines.

The Caput Coli has sometimes been found within a part of the Arch of the Colon, or one part of the Arch of the Colon within another, or the under part of the sigmoid flexure of the Colon within the Rectum, or the Cæcum, and whole of the Colon sometimes pass through the Rectum, forming an external swelling, or Procidentia Ani.

An Intus-Susceptio most frequently takes place when the contiguous Intestines are of unequal diameter, hence the termination of the Ileum sometimes passes within the Colon; and such a displacement very often proves fatal even to infants, as in the subjoined engraving.

An unnatural irritation, by exciting a partial contraction, sometimes proves a cause of Intus-Susceptio.

Worms frequently have been found at the Intus-Suscepted portion; and it seems not improbable, that the drastic purgatives employed for the removal of these may increase the mischief.

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* Vid. Edinb. Phys. Essays, Vol. II. art. 27.

Costiveness is also a frequent source, or prelude of this disorder, the hardened fæces, or scybala, being the causes of considerable irritation.

Such irritations frequently produce so unnatural a contraction of the parts affected, as to oppose the free passage even of air; for which reason, one part is often contracted, while that immediately adjoining remains in its natural state. The unnatural obstruction impairing the functions of the Stomach and Intestines, a quantity of air is generated, which is an additional cause of distention.

The Muscles of children being more irritable than those of the adult, the Intus-Susceptio is more frequent in early life, though less dangerous, on account of the greater laxity of fibre, and slighter degree of stricture, swelling, and inflammation: whereas, to grown persons, the disease is more certainly, and more immediately fatal, the greater rigidity occasioning a more obstinate spasm, with a greater tendency to inflammation.

Symptoms.

From what has been stated respecting the Morbid appearances, it follows, that there are two very different kinds of Intus-Susceptio, viz. that which is unattended by inflammation, and that attended by acute inflammation and its consequences.

The former, which occurs generally during infancy, in most cases does not merit the name of a

disease, as it does not derange the functions of the Alimentary Canal; whereas the latter, which may be ranked among the diseases of manhood and old age, is one of the most acute and fatal disorders incident to humanity, as the stricture almost immediately causes an inflammation of the displaced Intestine; hence the difficulty of distinguishing this disease from inflammation of the Intestines, excited by other causes.

The sudden appearance of the Symptoms after violent straining at stool, the impossibility of throwing up by the Anus as much liquid as in a state of health, together with the sudden appearance of a hard Tumour on the left side of the Abdomen, and which is painful on pressure, afford a strong presumption of the existence of an Intus-Susceptio.

The symptoms and progress of the inflammatory species of the disorder were well marked in the case from which Plate XXI. was taken, which was treated by my Father, whose statement I have therefore subjoined.

"On the 23d of February 1793, I was desired to visit the son of Mr ——, four months old, who had been inoculated for the Small-Pox by Mr Andrew Wood.

"I was informed by his nurse, that in the forenoon of that day, the child had had a very large stool, which came away suddenly, after a good deal of straining; the child seemed to be in great pain, and

cried incessantly for a considerable time. In a few hours, the pain somewhat abated, and he seemed to have a strong desire to go to stool; but notwithstanding repeated efforts, he passed nothing but slime, slightly streaked with blood.

" Various Laxatives and Clysters also were prescribed, but in vain. Having observed, that but little could be thrown up, I was struck with the suspicion, (which I mentioned to Mr Wood,) that it was probable, during the effort at stool, one part of the Intestine had passed downwards within the other, so as to produce the Intus-Susceptio.

" The above suspicion of the nature of the disorder was still more probable, from finding, on farther trial, that the strongest purgatives did not move him, and that not above one-fourth part of the quantity which a child is capable of receiving could be thrown up by the Anus.

" This last circumstance showed likewise that the Intus-Susceptio was near to the Anus.

" Repeated attempts were made to replace the Intine by means of Clysters, but the resistance could not be overcome, and the child died in 68 hours.

" A very extensive Intus-Susceptio, accompanied by a great degree of swelling, and thickening of the Intestine, were observed upon Dissection.

" The end of the Ileum and beginning of the Colon, which is called Caput Cæcum Coli, had been pushed upwards within the Colon, by the Muscular action of this portion of the Intestine, then across the

great Arch of the Colon, and from that downwards to the Rectum; that is, the half of the Colon which is on the right side was inverted, and taken with the Ileum, which it dragged along with it into the lower half, or left side of the Colon.

"The thickness of the Coats of the Intestine which had been displaced, was very remarkable, considering the very rapid progress of the symptoms. Vid. Plate XXI.

Intus-Susceptio is very much to be dreaded on another account, because, although of itself not always immediately fatal, it is very apt to lay the foundation of a permanent stricture, or of mortification of the included Intestine.

Of a portion of Intestine discharged by Stool.

There have been instances in which a considerable portion of the Ileum has been discharged by stool.

There are several such specimens in the Museum of the University, Edinburgh.

Mr Bower gave me a portion of the Ileum, measuring about fifteen inches, which had been discharged by stool. The patient enjoyed good health for seven years afterwards.

My Father used to explain in his Lectures the above very remarkable fact, by supposing a previous Intus-Susceptio, in which the Stricture had strangulated the portion of Intestine evacuated, and had

occasioned a mortification at the upper part of the Intus-Suscepted portion, whilst, by exciting adhesive Inflammation in the superior and inferior portion, it had produced an adhesion of the superior with the inferior portion, and consequently a continuity of Canal.

For an account of another similar case, in which there were several shreds and smaller pieces passed by the patient, I beg leave to refer the reader to the second Volume, and art. 27th, of the Edinburgh Med. and Phys. Essays, page 361.

EXPLANATION OF PLATE XXI.

This Plate represents an Intus-Susceptio.

AB, A probe introduced into the Ileum.

C, The Valve of the Colon.

D, A probe within the Appendix Vermiformis.

E, The end of that Appendix.

FF, GG, HH, The inverted part of the Colon cut open at FF, HH, and left entire at GG.

II, Part of the Colon plaited together, and receiving the Ileum.

At each side of the cut end of the Ileum is seen a portion of the Ileum, with fat and Glands not included in the Intus-Susceptio.

KK, Part of the Colon laid open to show the Intus-Susceptio.

LL, Part of the Colon left entire.

PLATE, XXI.

[*This important communication was sent to the Author after the preceding sheet was printed off.*]

Mr A. Burns sent, for my inspection, a preparation, illustrative of what he calls a double Intus-susceptio, with the following description of it:—

"The case occurred in a boy of about 12 years of age.

"The Caput Coli, and transverse arch of the Colon, were intro-suscepted into the Sigmoid flexure of the Colon and Rectum.

"The peculiarity in this case, consists in an inversion of the intro-suscepted portion, after it had slipped within the first fold.

"There is thus one intro-susception within another.

All the inverted portion of intestine was highly inflamed—in some places thickened by the Coagulable Lymph within its Coats, and the part next the Anus was gangrenous."

SECTION II.

Of Procidentia Ani.

Having explained in a former Section the nature of Intus-Susceptio, I shall only observe respecting the Procidentia Ani, that it differs but little from an Intus-Susceptio *, and occurs more frequently in children than in adults, and is often symptomatic of Worms, Hæmorrhoids, &c. or of the Stone in the Bladder.

If the Prolapsus be not speedily removed, it is followed by swelling, the unnatural discharge of Mucus, Inflammation, and sometimes by Gangrene.

In the adult, the Villous Coat is in some cases only displaced, forming folds.

SECTION III.

Of Herniæ or Ruptures.

The importance of the subject, on which we are about to enter, must be apparent to every one, who

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* Procidentia Ani (says Mr Hunter) "differs from introsusception as not being contained in a gut; for, instead of having an inclosing gut inverting itself by its own action, there is an inclosed gut protruded by the action of the Abdominal Muscles, and the passing of the fæces through it, and the point of inversion is at the extremity of the protrusion, and as it inverts it pushes out of the body." Vid. Trans. of a Society for the Improvement of Medical and Chirurgical Knowledge, p. 112.

reflects upon the prevalence of the disease, on the various forms and situations of the Tumour, on the ignorance of most patients respecting the particular nature of the disease, and on the fatal consequences which arise from mistakes on this point.

No age nor condition of life is entirely exempt from Herniæ; the old and the young, the laborious and the idle, the corpulent and the lean, the rich and the poor, are subject to it. But though all are liable to this disease, they are not equally so; the differences of age, sex, constitution, and condition of life, not only occasioning a greater or less disposition to Hernia in general, but also determining the particular species of the disease.

Amongst the different ranks of society, the lower orders, owing perhaps to their continual labour, are most exposed to Hernia, and to them the disease proves more certainly fatal, as labour not only gives rise to the complaint, but tends to aggravate it when formed, and poverty too often prevents their obtaining the means which may arrest its progress.

The disease, when neglected, sometimes proves fatal in a few days, and even when of a milder form, always imposes on the patient some degree of restraint; for any muscular exertion may change its form so far, as to reduce the patient to a state of imminent danger.

The frequency of Hernia, and the number of useful persons from this cause lost to society, gave rise to a charitable institution in London, of which the object is to relieve the Ruptured poor.

The records of this Society furnish data, for making an estimate of the proportion of persons afflicted by Hernia.

Mr TURNBULL, Surgeon of that Institution, states the average as one to fifteen. "Few men (he observes), have taken more pains to ascertain this peculiar point than myself, and after the most diligent and general inquiries throughout the kingdom, I am induced to take them, male and female of all ages, upon an average of one to fifteen." ARNAUD and GIMBERNAT entertain a similar opinion as to the proportion of persons afflicted by Hernia.

Since the publication of my Observations on Crural Hernia, I have endeavoured to ascertain the proportion of persons who are afflicted by this disease, and in the course of the inquiry, have received much valuable information from various correspondents.

I resorted to the records of our Dispensary, an ample field of information, as is obvious from the following statement. I have added a list of the number of patients who received advice during several years, and also of the number who have got trusses:

Years.	Total Number of Patients.	Single Trusses.	Double Trusses.	Ruptured Children.	Total number of Ruptured.
1805	1621	11	3	3	17
1806	1551	5	1	1	7
1807	1637	14	4		18
1808	1318	8	3	3	14
1809	1729	14	4	6	24
1810	2936	12	1	2	15

Mr Ingham, of Newcastle upon Tyne, has favoured me with the following report from that city.

Total number of Patients admitted at the Newcastle Infirmary.		The number afflicted with Hernia on one side.	The number afflicted by Hernia on both sides.	Proportion of children under the age of 15 years.	Total number afflicted by Hernia.
In the Year					
1808	1178	33	7	7	47
1809	1185	30	5	8	43
1810	1349	35	2	5	42

The following is an extract of a letter from Dr Brandreth of Liverpool.

"I have sent you what appears upon our books at the Dispensary, as the average of Ruptured Patients, but I am well assured, it is very much below the real truth, as many patients apply for relief for other disorders who have Hernia, which not being the principal complaint, is of course not mentioned in the book, and I think the number expressed consists almost of those who have been supplied with trusses. I am also unable to give any opinion respecting those who are ruptured on one side, or both; and also, whether they are male or female. In the last ten years, we have had 119,685 patients, of whom 955 were ruptured. The mere statement will convince you that it is much below the truth.

"Your's very truly,

"W. Brandreth."

This opinion of Dr Brandreth is confirmed by Mr Marrison, Trussmaker from Liverpool, who assured me, that in his opinion, about one in twenty is ruptured in that city.

Mr Gibson of Manchester favoured me with the following report.

The total number of Surgeons' Out-patients from September 1, 1809, to September 1, 1810, amounts to - - - - - - - - - - - - - - 1486

The total number with Hernia on one side amongst these - - - - - - - - - - - 149

Ditto ditto on both sides, - - - - - - 43

At the Workhouse, there are of men, women, and children, - - - - - - - - - - - 305

The number with Hernia on one side, - 19

Ditto ditto on both sides, - - - - - 1

Of these three are females, and one child.

I have received, through Dr Redemonde, from Dr Versturme, Inspector-General of the German Legion, a very valuable document, which tends to throw much light on the proportion of young men afflicted by Hernia.

It may be proper to observe, that all foreigners who presented themselves in Hanover, were sent over to the Foreign Depôt at Lymington, and before being admitted into the British service, are examined.

Dr Versturme sent me the following statement.

"*Statement of the number of foreign recruits rejected and invalided, from 26th March 1796 to 31st December 1810, on account of Ruptures.*

"Number of recruits examined, 40,460; rejected for Ruptures, 365.

"Number of men invalided, 2728; of whom 316 were on account of Ruptures.

"Total, 681."

According to Dr Robertson of Greenwich Hospital, one in fifteen of the In-pensioners is ruptured, but only one in forty of the Out-pensioners*.

In the Memoirs of the French Academy of Surgery, there is the following statement, that in an Hospital devoted to the reception of women, 220 of 7027 were Ruptured; that in the Bicetre, which contains 3800 men, only 212 were Ruptured; that at the Hotel of Invalids, where 2600 are received, 155 only had Hernia; and of above 1037 young men received into the Hospital called de la Pitiè, only twenty-one were Ruptured.

In Germany, one in thirty has been stated by Juville, in his Treatise on Trusses, to be Ruptured; and one in fifteen in Spain and Italy.

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* Vid. Sir John Sinclair's Code of Longevity.

I shall not endeavour to explain the causes of the great difference in the preceding statements.

It is no doubt extremely difficult to determine the proportion of the ruptured with mathematical accuracy, for there are various sources of error.

There are many afflicted by Hernia, and more especially females, who studiously conceal the complaint; there are others, who from the swelling being small, do not know they are afflicted by the disease; whilst a third description suffers little uneasiness from the disease, and do not apply for medical aid. There is still another source of error.

Dr Brandreth in the letter which I received from him, observes: "I made some efforts at the workhouse, where we have about 1200 people, to find out what proportion were ruptured, but unfortunately there have been two operations, which have terminated fatally in the last year, and the poor people used every effort in their power to conceal their complaint, under an apprehension, that they were intended to be *operated upon*, and I completely failed in my endeavours to remove it."

Definition of Hernia.

From the great variety in the situation of Herniæ, and the contents of the Tumour, it is difficult to define this disease in a manner which is unexceptionable.

A Hernia may be defined to be a Tumour, un-

connected with a wound, and produced by a bowel, or part of a bowel, which is not situated in its natural place, and the Tumour may be either external or internal *.

The Hernial Tumour generally is *external to the cavity with which it is connected*, and formed by the protrusion or prolapse of a bowel from the cavity, within which it was originally lodged, through a natural opening, preternaturally dilated; hence such swellings appear at the Groin, Scrotum, Labia Pudendi, bend of the Thigh, and Navel.

The protruded bowels are included within a Sac, which is formed by the elongation of the Membrane which lines the cavity from which the protrusion has taken place; hence the impropriety of the term Rupture.

Beside the above species of Herniæ, where the bowels have been protruded through what may be called natural openings, there are Ventral Herniæ of the belly, which appear where there is no natural opening: and in these cases, there is generally a rupture of the fibres of the Muscles, which constitute the parietes of the belly.

There are also *Internal Herniæ*, of which there

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* The definition of Hernia, given by Böerhaave in his Prælectiones Academicæ, of which Haller was the Editor, is a very good one.

Herniæ) "Ita vocamus partium mollium ex membranis cavis coercentibus dislocationes in aliena loca, ut adpareat esse quasi luxationem partes mollis."—Vid. Tom. VI. p. 51.

are the following varieties. 1st, There is an Internal Hernia, where there is a small Tumour, as when a part of the Intestines is engaged within the upper part of the Inguinal Canal. 2d, Where there is a Tumour, which, on account of the thickness of its coverings, is in most cases scarcely perceptible, as the Obturator and Ischiatic Herniæ. 3d, Where, at the commencement of the disease, there is in most cases no perceptible Tumour, but where, in consequence of the duration of the disease, a Tumour appears, as the Perineal Herniæ. 4th, There has a species of Internal Hernia been described, but in my opinion improperly, when stricture, amounting to strangulation, has been made upon a part of the Intestines, in consequence of an unnatural aperture in the Diaphragm, of malconformation of the Omentum, Mesentery, Mesocolon, or of an unnatural appendix to the Intestines.

Of the Causes of Hernia.

There being a constant action and reaction between the contained and containing parts, those causes which diminish the resistance of the containing, or increase the pressure of the contained parts, may give rise to Hernia.

Those causes which diminish the resistance of the Parietes, *predispose* to Hernia, and those which increase the pressure of the contained parts, are the *occasional or exciting causes* of the disease.

Local Debility predisposes to Hernia.

Debility of the parietes of the Abdomen is connected with their office in giving passage to the Spermatic chord, round ligament of the Uterus, Crural and Umbilical vessels.

This debility of the parietes of the Abdomen is proportioned to the size of the Apertures; men, therefore, are more disposed to the INGUINAL, and women to the CRURAL HERNIA.

The different Herniæ have been named from their situation, or from the contents of the Hernial Sac; hence the terms EXOMPHALOS or UMBILICAL HERNIA, BUBONOCELE or INGUINAL HERNIA, OSCHEOCELE or SCROTAL HERNIA, MEROCELE or CRURAL HERNIA, HERNIA of the PERINEUM, of the FORAMEN OVALE, and the ISCHIATIC RUPTURE.

The Mesentery being longer than the Mesocolon, the smaller Intestines are more frequently displaced than the larger, to which the vicinity of the Ileum to the Inguinal and Crural Apertures also contributes.

When the Hernial Sac is filled by a portion of the Intestines only, the Tumour has been called *Enterocele;* and when the *Omentum* is also included within the *Sac*, the term *Entero-Epiplocele* is used; and the terms *Hepatocele, Splenocele, Hysterocele, Cystocele* are employed, when the *Liver, Spleen, Uterus, or Bladder of Urine,* form the contents of the Hernial Tumour.

The term CONGENITE has been used when the bowels are contained within the same Canal as the

Testicle, and also as expressive of the period of life at which that kind of Hernia generally shows itself.

The unnatural *relaxation* of the Peritoneum which retains the bowels of the belly in their proper situation, may be conjoined with debility of the parietes of the Abdomen, and may give rise to Hernia; and hence a bowel which, in the healthy state, is firmly bound down by the Peritoneum, as the Caput Cæcum Coli, sometimes gets into the Hernial Sac.

The looseness of the Peritoneum passing between the Rectum, Vagina, Bladder of Urine, and Abdominal Muscles, (which is well calculated to admit of the free distention of the Bladder and Uterus,) may have a share in facilitating the displacement of the Intestines at the Inguinal or Crural Apertures.

Dr Camper is of opinion, that the relaxation of the Mesentery concurs with that of the Abdominal Muscles in giving a disposition to Hernia.

Debility in the Parietes of the Abdomen may be born with us, or acquired during the progress of life.

Hence many children, soon after birth, are afflicted by Umbilical Hernia; and of the latter observation, the preceding report of Dr Versturme affords a striking example.

There are various causes which lead to such a Morbid state, as improper diet, a sedentary life, a long train of bad health, the abuse of medicine, or a long residence in warm climates.

Debility of the Parietes of the Abdomen is, independently of an unusual structure, peculiar to some

families, and is hereditary, and descends from father to son, and even to the grandson.

Where there exists such a debility in the Parietes of the Abdomen, we sometimes meet with several Herniæ in the same individual, as in the following case, which fell under the observation of my Father.

Mr J. B. 50 years of age, has had from his infancy an Umbilical Hernia; when about four years old, he received a blow on the Groin, a Bubonocele immediately followed, and about eight years afterwards, a Hernia took place in the other Groin, and without an evident cause.

Plate XI. affords an additional example of debility in the Parietes of the Abdomen; for there were, in that case, four different Herniæ, viz. two Crural Herniæ on the right side, one on the left side, and also a Pudendal Hernia.

External violence in some cases gives rise to local debility of the Parietes of the Abdomen. I lately had occasion to examine a sailor who had a swelling of the two uppermost Lumbar Vertebræ, and upon the right side of the Spine there was a Tumour about the size of the fist. I supposed, before examining into the history of the patient, that he had a Lumbar Abscess, but, on pressure, perceived that the Tumour communicated the same sensation as a Hernia, and I readily reduced the Tumour.

The patient had received a violent blow upon the back, while moving a sugar cask; the swelling of the Vertebræ immediately followed, and about six

months afterwards, the Tumour at the side of the Vertebræ became as large as an orange.

The *enlargement of the Apertures in the Parietes of the Abdomen*, predisposes to Hernia; hence the extension of the Inguinal Canal, occasioned by the Testis passing through it, renders males more subject to Hernia Congenita, and Bubonocele, than females.

From a similar cause, women who have had many children at short intervals, or who labour under a Dropsy of the Ovarium, are frequently afflicted by Umbilical Hernia. The Umbilical Ring, in such cases, being distended beyond its natural size, is thereby weakened, and is apt to remain so; especially in those of a relaxed habit of body, even after delivery.

This enlargement becomes greater and greater in every future pregnancy.

Upon the same principle, the frequency of Hernia in old fat women, in people who have long laboured under Asthma, or stricture of the Urethra, may be explained.

Malconformation of the Parietes may be enumerated among the causes which predispose to Hernia.

The Brain, when uncovered, unprotected, and unsupported by the upper part of the skull, has been sometimes displaced, and then forms a large external Tumour.

There are, in the Museum of the University, five

cases, of such a deficiency of the upper part of the skull, where, upon dissection, I found the brain perfect, and it was covered by the skin of the head, under which a good deal of blood had been effused, which had coagulated; but in other cases, where the upper part of the skull is wanting, the brain was imperfect*.

There are various degrees of imperfect Ossification of the skull. Sometimes only a small part of it is wanting. I had occasion to visit a child, along with Mr Charles Anderson of Leith, with a Tumour five or six inches in circumference, which projected about two inches above the level of the right Parietal Bone, the centre of which was not Ossified.

The Ossification of the skull in process of time having been completed, the protrusion of the brain disappeared.

In children born with the Hydrocephalus, a considerable part of the brain is covered by Membranes only, and has sometimes been protruded through the unossified part of the skull.

I had occasion, a few years ago, to examine the body of a child of two years of age, who died from Hydrocephalus, upon whose head there were two Tumours in the Lambdoidal Suture, formed by a protrusion of the brain.

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* Vid. Monro on the Nervous System.

I have also seen a hole in the Os Occipitis, through which part of the contents of the skull had been protruded.

A Hernia of the brain is sometimes complicated with Hydrocephalus. Mr WARDROP lately shewed me a specimen of this description.

A child was born with a Tumour twelve inches in circumference on the back part of the head, where the Sagittal and Lambdoidal Sutures unite. There being a distinct fluctuation at one part of the Tumour, it was punctured, and fourteen ounces of Serum, mixed with a few red Globules, were discharged from it. A pledget was put over the punctured place, with the view of excluding the air. The Tumour began again to fill.

In the course of six days, a second puncture was made, by which four and a half ounces of a fluid were discharged. The Surgeon left the puncture uncovered. A small quantity of fluid distilled from the orifice, until the child's death, which took place nine days afterwards. The patient's body was examined twenty-two hours after death. The Brain and Cerebellum were found to be soft, the latter the Surgeon called flaccid, and quite perfect. A quantity of a purulent fluid was found within the Ventricles.

It is foreign to the business of this essay, to enter into detail concerning the nature of those Tumours, which appear after fractures, or erosion of the skull, attended by a laceration of the Dura Mater. In

such cases, we sometimes observe a Tumour covered with clotted blood, which, when divided, is found to be composed of coagulated blood, of lymph, and of a substance like brain. Escharotic applications are sometimes applied to such Tumours, and with benefit; and in some such cases, the Tumour is removed, and is skinned over, and the patient recovers.

The Thoracic Viscera, in consequence of malconformation, have been found upon the outer part of the Chest, or within the Abdomen.

I met with a singular instance of Monstrosity in a lamb, the heart and lungs of which were on the outer side of the ribs.

The Parietes of the Abdomen are occasionally imperfect at the fore or back part.

The deficiency of the fore-part of the Abdomen is most frequent. My colleague, Professor HAMILTON, has several such specimens in his Museum, and he has met with others in his extensive practice, in which there was a deficiency of the Parietes of the Abdomen around the Navel, the bowels of the Abdomen being in those cases supported only by the Peritoneum, formed a prominent Tumour. The Peritoneum generally bursts in a short time, and the child dies immediately. MORGAGNI has published a case, in which a child lived for thirty days, with such a Tumour, as large as the fist, in the front of the belly.

The malconformation has sometimes been limited to the Apertures through the Abdomen, thereby

producing varieties in the Inguinal and Congenital Herniæ, which are described under their proper heads, in a subsequent part of this volume.

A Malconformation has been sometimes observed in the back as well as the fore-part of the body.

My Father was desired to visit a boy six months old, along with Dr Farquharson, in whom both Kidnies passed through large apertures in the Muscles of the Loins, and were covered by the common integuments only; and the Apertures were so large, that the Kidnies could be easily reduced, but were difficultly retained within the Abdomen.

A Malconformation of the Pelvis may also give rise to a Hernia of the Bladder of Urine.

I have seen three cases, in which the back part of the Bladder of Urine was inverted and protruded, and formed a red-coloured Tumour on the fore-part of the belly: and the surface of the Tumour was kept continually moist by the Urine, which distilled drop by drop from two small holes, the extremities of the Ureters.

One of the patients was a stout man, 36 years of age. The Penis was almost entirely awanting.

In its stead there was a substance about an inch long. The Ossa Pubis were separated in the man about two inches from each other.

The Hernia called Ischiatic, may perhaps be occasioned by a Malconformation, for the pyriform Muscle, Sciatic Nerve, and small vessels completely fill up the Sciatic notch in the natural state.

My Father had occasion to visit a child with a large Tumour under the Glutei Muscles, which became tense when the child cried, owing to the Tumour containing a large portion of Intestine.

This case is somewhat similar to that related by Papen, in Haller's Collection of Surgical Treatises, where there was a very large pendulous Tumour on the right side of the Anus, which, upon dissection, was found to resemble an oblong flask; its length was an ell, and the circumference of the lower part of it half an ell. The patient was obliged to elevate and compress it, with the view of promoting the discharge of the fæces.

Camper has described a similar case in his Demonstrat. Anat. Pathol. Lib. 11.

The Obturator Hernia may probably be classed under the head of Hernia, occasioned by the unnatural size of the Obturator Aperture.

The inordinate *distention of the Viscera by water*, may not only predispose to, but also occasion Hernia.

A large quantity of water collected within the Ventricles of the Brain of an infant, has led to the protrusion of that organ; the bones, in such circumstances, recede from each other.

There are even instances in which the unnatural accumulation of water within the *Ventricles of the Brain*, has disunited the bones of the skull, after these have been firmly united and consolidated.

I attended a boy of ten years of age, who lingered under Hydrocephalus for sixteen months. He retained his senses until within three months of his death, and frequently exclaimed, that he suffered the most excruciating headache, and was sure his head would split. His prediction was just, for the bones of the Cranium were disunited, and the pressure upon the brain being diminished, he lived for fifteen months under the disease.

Of the state of the Hernial Sac, its contents, and the neighbouring parts, in Chronic Herniæ.

Time produces a great change upon the Hernial Sac; sometimes it becomes much thicker, consisting of distinct layers.

The stimulus applied by the displaced bowels excites, in an unnatural degree, the vessels of the protruded Peritoneum, by which it increases in thickness and extent, and thereby accommodates itself to the quantity of its contents, becoming, in large Herniæ, so capacious, as to be capable of containing the greater share of the Intestines.

Sometimes the Hernial Sac attains the consistence of Cartilage.

The thickness of the Sac does not always bear a proportion to the size of the Tumour; for even in small Crural Herniæ, I have seen the Hernial Sac of a very considerable thickness, and of a Cartilaginous consistence.

I have also remarked, that though that part of the Sac which is external to the Parietes of the Abdomen had attained an unnatural thickness, yet the neck of the Sac was not thicker than the healthy Peritoneum.

On the other hand, the neck of the Hernial Sac sometimes becomes much thicker than its body, and frequently proves the cause of stricture.

The condensation of the Cellular substance around the Sac, adds considerably to its thickness; it is generally thicker at its neck than elsewhere: and sometimes the Cellular substance consists of distinct layers, so that it becomes difficult for the Surgeon to determine when he has reached the Peritoneum.

Tumours growing from the inner side of the Sac, also add to its thickness.

In two cases of Hernia, I have observed small Tumours growing from the inside of the Sac, (Vid. Plate XIII. fig. 4.) by which it attained an unnatural thickness.

But in large Herniæ, the Sac frequently becomes thinner than even the healthy Peritoneum, and sometimes also so tender, as to be ruptured by the effort of coughing*.

The unnatural thinness of the Hernial Sac has been remarked more frequently in the Umbilical than in other Herniæ.

The Hernial Sac has been supposed to be destroy-

* Vid. Mersenne, Journal de Med. Tom. 23.

ed, in consequence of the rapid increase of the bulk of the Hernia; but such an opinion is incorrect: for though the Sac seems to be wanting, it is not so, the deception proceeds from the very intimate union between the Sac, the adjacent Cellular substance, and fat.

The Coats of the portion of Intestine which has been lodged for some time within a Hernial Sac, sometimes acquire an unnatural thickness, in the same manner as the Muscular fibres of the Heart, or Bladder of Urine, become much thicker and stronger, when the blood or urine does not find a ready exit.

The Omentum included within the Hernial Sac, often contracts an adhesion to the body, or neck of the Sac, and not only proves an obstacle to the reduction of the Hernia, but also renders it impossible, by pressure, to prevent the other bowels from sliding into the Hernial Sac.

The protruded portion of Omentum in some cases becomes very bulky and lobulated, and somewhat like a Steatom, and at the same time so much indurated, so that it has been supposed by some to be Scirrhous.

In the Museum of the University of Edinburgh, several specimens are preserved, in which the protruded Omentum was much harder than natural, and resembled a bunch of grapes, and in one case, it weighed two or three pounds.

Suppuration is another, though very uncommon, state of the protruded Omentum.

Transverse bridles have sometimes, though very rarely, been observed passing across the Sac.

The Blood-vessels, and also the Lymphatic vessels of the protruded portion of Intestine, often acquire a very unusual size. My Father, while prosecuting his studies at Berlin, having procured the contents of a large Chronic Hernia, in which the Lacteal Vessels of the protruded Intestine and Mesentery were considerably enlarged *, was enabled to fill these vessels with great success with quicksilver; and these preparations attracted the attention of his pupil, Professor SOEMMERING, so much, as to lead him to make particular mention of them in his treatise on the diseases of the Lymphatic System.

Should the Chronic Hernia be Scrotal, the connecting fibres of the tendinous columns of the under Abdominal Aperture, attain an unnatural thickness, and make an impression upon the Hernial Sac †.

Of the Symptoms and Consequences of Chronic Hernia.

When there exists a predisposition to Hernia, it proves less dangerous, though a more tedious disorder, than where there is no such predisposition; therefore, in my *Observations on Crural Hernia*, I

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* Vid. Engravings of these in FYFE's Anatomical Plates.

† Vid. CAMPER's Engravings of Herniæ.

arranged Herniæ under two great classes, the CHRONIC and the ACUTE HERNIÆ. These are no doubt the extreme cases, and there are many intermediate shades.

Where debility of the Parietes of the Abdomen exists, the bowels are gradually protruded through a dilated Aperture in the Parietes, in consequence of a very slight occasional cause; and the situation of the Tumour, and sensations it communicates, proclaim the nature of the disease.

Before the bowels descend, the patient has a sense of fulness, tension, or weakness in the Groin, when in the erect posture, and especially upon taking exercise, or coughing.

A small Tumour shews itself in a short time after some slight exertion.

I had occasion to see a Hernia produced in an old man, who had long laboured under a Scirrhous Stomach, by so slight an effort, as turning himself in bed.

The Tumour is not painful, even when pressed, and sometimes creates so little uneasiness, as not to draw the attention of the patient, until it has acquired a considerable bulk.

The size and figure of the Tumour are by no means uniform, even in the same species of Hernia, owing to the particular bowel included within the Sac, peculiarity of constitution, and the posture of the patient, for it swells out in the erect posture, be-

comes less in the recumbent posture, disappears on pressure, and enlarges upon the pressure being removed.

Dr Redmonde, Inspector of Hospitals on the North British Staff, follows an excellent method of detecting Herniæ in recruits, which he thus described to me by letter.

"Our method is very simple, and I believe uniformly successful; it consists in nothing more than producing a sudden violent action of the Abdominal Muscles; we direct the recruit to cough, and placing a finger close to the ring, at once feel whether there be any protrusion of the Gut; should this fail, and from the laxity of the parts, there remain any suspicion of a Rupture, we direct the recruit to jump repeatedly as high as possible, which never fails to occasion a protrusion of the Gut, if Rupture be present. The disease is very seldom fatal in the army; in nearly twenty years service, I have no recollection of a fatal termination of Hernia."

By a minute examination, and by attention to the symptoms, the contents of the Tumour may generally be discovered, providing it be not very small, hard and tense, and the patient very fat.

A Hernia filled by a portion of *Intestine* is generally to the touch soft, elastic, and compressible, and when compressed, feels somewhat flabby, the displaced bowel being commonly filled by air; and when the patient coughs, it communicates a

sensible impulse to the hand, and a gurgling noise may be heard when the Intestines slip back into the Abdomen, and the Hernial Sac then feels empty.

But when fæces are within the displaced portion of Intestine, the Tumour is, when pressed, like to that occasioned by a protrusion of the Omentum.

The Omentum being very moveable, unattached at its lower part, and covering in part the Intestines, frequently forms a part, or the whole of the contents of a Hernial Sac. Such a Hernia has generally a broad basis, is to the touch soft, unequal, and incompressible, is not enlarged by coughing, is not painful, and is with difficulty returned, as the protruded Omentum takes the shape of the Aperture through which it has passed.

The Omentum of Children being very thin and transparent when protruded, constitutes a Tumour, which bears a strong resemblance to a Hydrocele.

Protrusions of the *Omentum* are always to be regarded with a suspicious eye, as paving the way for a protrusion of the Intestines.

In order to return the *Omentum*, it is necessary, as Mr Pott has observed, "to follow it with the finger to the last."

The *Omentum* sometimes forms a complete, or only a partial envelope to the Protruded Intestine, rendering the whole, or only a part of the Tumour, soft, unequal, and incompressible.

Where a part of the Tumour is uncovered by the

Omentum, it is elastic and compressible, and the motion of the air passing from one part of it to the other is perceptible, whilst the rest of the same Tumour is doughy, soft, and almost incompressible.

The functions of the bowels, from the slight pressure made on them by the margin of the Aperture through which they have been protruded, are in some cases but slightly impaired, except when the Hernial swelling attains a large size.

But even when the contents of the Hernia have been returned into the cavity of the Abdomen, it sometimes happens, that the functions of the Alimentary Canal are much impaired, and the patient suffers from a degree of squeamishness, slight Colic, indigestion, and constipation.

Where the Hernial Tumour is unsupported, more of the *Intestines*, and more of the *Omentum*, slip down: and there have been instances, in which the greater part of the moveable bowels has got into the Hernial Sac, which has been so large as to hang as low down as the patient's knees, and the contents of the Tumour cannot in most cases be returned into the Abdomen. Such large Herniæ generally contain more or less of a watery fluid.

Notwithstanding the slight pressure made by the enlarged apertures upon the Blood-vessels, proper to the protruded Intestine, it proves an obstacle to the free return of the venous blood; hence a serous fluid, amounting in some cases to two or three pounds,

is effused into the Hernial Sac, and the fluid adds so much to the bulk and weight of the Tumour, that it is necessary to draw it off by a puncture.

Though such large Herniæ cannot be reduced, and are not immediately dangerous to patients who are attentive to diet, regimen, and to the state of the body, and who wear a proper truss, yet they prove the source of uneasiness: The Penis is sunk as it were in the swelling, the skin is fretted and inflamed by the Urine distilling along it, the patient is incapable of copulation; and much bodily exertion is painful, and even dangerous, for it may change the form of the disease, and may lead to strangulation, by forcing down more of the bowels into the Hernial Sac; besides the Testicle has sometimes been destroyed by the pressure of the displaced Intestines upon it.

Constipation and Colic are the usual concomitants of the irreducible Hernia; for the contents of the Intestines are in those circumstances propelled onwards, solely by the Muscular contraction of the Coats of the protruded Intestines, for the contraction of the Abdominal Muscles cannot materially promote their evacuation. The functions of the Intestines do not go on well, the Coats of the bowels having in consequence of the retention of their contents lost their tone; hence the Tumour, which had been in the morning comparatively small and soft, becomes after meals hard, tense, and much larger.

The accumulation of fæces sometimes leads to a low species of Inflammation of the Hernial Sac, and of its contents; and hence the Sac contracts an adhesion with the neighbouring fat and Cellular substance, and also with the Aperture through which the displaced bowel had passed.

A relaxed habit of body, and the dilatation of the Inguinal Canal, do not always prove a safeguard against strangulation, which may originate from various causes. An extraordinary quantity of air within the Alimentary Canal, or violent coughing, vomiting, or sneezing suddenly, forcing more Intestine into the Hernial Sac, or the accumulation of fæces within the contents of the Hernial Sac, may induce immediate strangulation, and its fatal consequences.

The thickening of the neck of the Hernial Sac and of the adjacent Cellular substance produced by wearing a truss, or even by the pressure it undergoes in Hernia, of considerable duration, may produce the same effect.

A transverse bridle in the Hernial Sac, occasioned by preternatural adhesions; a fissure in the Omentum when much indurated, and foreign bodies swallowed, may produce the strangulation.

The patient then becomes feverish, suffers a good deal from the tension of the Tumour, and provided the strangulation be not removed, inflammation follows.

But the strangulation is of a very different de-

scription from that which takes place in one who is not disposed to Hernia.

The strangulation generally proceeds from the unnatural accumulation of fæces within the displaced Intestines, the Coats of which thereby lose their tone.

The patient does not suffer instant acute pain.

The progress of the swelling and of the inflammation in such debilitated constitutions, is not so rapid as in the more robust and plethoric, so that an operation proves a cure, even when performed several days after strangulation has taken place.

Of the Acute Hernia.

The acute is that species of Hernia which appears suddenly after a violent exertion, where there exists no predisposition to the disorder, and is induced by a sudden protrusion of some bowel, or part of a bowel, in consequence of the great pressure of the Diaphragm and Abdominal Muscles, as during the acts of raising, and carrying heavy weights, or in running, or leaping *.

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* It has been stated by BLUMENBACH, that Herniæ are more frequent among the inhabitants of the Alps than in other countries; but this observation does not hold true with respect to Scotland: for by the returns from the northern districts, it does not appear that Herniæ were more frequent in these than in the more southern recruiting districts.

During such extraordinary exertions, the Abdominal Muscles are thrown into violent contraction. The descent of the Diaphragm during inspiration, necessarily pushes the bowels against the elastic Peritoneum, and the Parietes of the Abdomen, incapable of resisting the impelling cause, give way at the weakest part, where the various cords and vessels pass through them.

Immediately after the violent effort, a small, hard, and painful Tumour, presents itself, and the patient has the sensation as if something had given way.

Should it be impossible by pressure, and other means to remove the swelling, the progress of the symptoms is rapid like those of Enteritis, for the protruded portion of bowel is so much constricted, as to impede not only the passage through the Alimentary Canal, but sometimes also the flow of blood through the vessels of the protruded bowels.

The bowels of the Thorax, like those of the Abdomen, sometimes overcome the resistance of their Parietes.

My Father met with such a case, and another was communicated to him by the late Professor of Midwifery, Dr Hamilton, in which the Pleura Costalis was ruptured by the effort of coughing.

Of the Appearances on Dissection, when death has been occasioned by a Strangulated Hernia.

The Peritoneum and Intestines betray marks of Acute Inflammation; hence the Morbid appearances

are similar to those which have already been described under the head of Peritoneal Inflammation of the Intestines *, with this exception, that the part of the Intestines nearest to the stricture, is found to be most inflamed. Above the stricture, the Intestines are much dilated, and occupy the greater share of the cavity of the Abdomen, but those beneath it are considerably contracted.

The part more immediately compressed, has the appearance, as if a cord had been put around it very tightly †, and is generally somewhat of a purple or leaden colour, and this stricture may cause considerable permanent contraction of the Intestine. The leaden colour is not an infallible index of Mortification; for even the Intestines, when of such a colour, sometimes retain their usual texture, for the distention of the smaller veins of the Peritoneal Coat, and of these which run in the loose Cellular substance by Venous blood, the reflux of which has been interrupted by the great pressure made upon the stricture, is the cause of the dark colour of the Intestines.

In a case of this description which I attended, the protruded Intestine, which was of a deep purple colour, was by no means Gangrenous, it did not tear, though repeatedly handled rudely, and even pinched by the forceps, employed for Anatomical purposes, and when kept for some time in spirits, entirely lost its dark purple colour.

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* Vid. page 248.

† Vid. Plate XII. fig. 1st, and Plate XIV. fig. 2d.

The above was a case of Crural Hernia, and the stricture upon the Intestine was so great, that even air would not pass it.

In some instances of Crural Hernia, I have remarked an effusion of Coagulable Lymph, not only on the surface, but also within the protruded Intestine *.

The Tendinous Fasciæ covering the Hernial Tumour, seldom partake of the Inflammation, a circumstance which is worthy of recollection; as thus, the Surgeon, during his operation, discovers, from the redness of the Hernial Sac, when he has cut down to it.

Of the Symptoms of a Strangulated Hernia.

From what has been stated respecting the Morbid appearances, it is obvious, that there must be a strong resemblance between the symptoms of this disease, and those of the Inflammation of the Intestines, excited by other causes; and the urgency of the symptoms depends on the age, sex, constitution of the patient, the kind of Hernia, and the particular bowel which has been strangulated.

Costiveness is one of the earliest symptoms when a part of the Intestine has been displaced, which is rapidly succeeded by hardness and quickness of the Pulse, which generally rises to 100, or 130 in the minute.

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* Vid. Plate XIV. fig. 2d.

If the stricture be not removed, nausea, retching, and vomiting speedily follow; and if a Cathartic is given to procure a stool, it aggravates the sickness, and is speedily rejected.

The Abdomen and Tumour become tense, hard, and very painful, especially when pressed, or on coughing, sneezing, or vomiting. The skin is dry, and the patient thirsty, and much flushed.

If a Clyster be thrown up, it only empties the contents of the Intestines beneath the stricture.

The pain in the Tumour becomes very acute; some patients compare their sufferings to burning at the region of the Stomach and Navel, and others, to a rope put very tightly around the belly.

The vomiting becomes still more urgent, and not only the contents of the Stomach, but even those of the Intestines are rejected; I have seen even fæces thus discharged.

Great anxiety and restlessness are the usual concomitants of this disease during its whole course.

It merits particular mention, that the patient may be in imminent danger, though the pulse be slower than usual.

Dr Baillie has observed, "that the pulse is by no means an infallible index of the state of the protruded Intestine. The pulse is sometimes, in such a case, not increased in frequency beyond the standard of health, and yet the inflammation of the bowel has been discovered afterwards, by the operation, to be very great." This is an important prac-

tical observation, because it shows that the degree of inflammation is not to be judged of from the pulse, and teaches, that the operation should not be delayed, after the proper efforts for reducing the rupture have failed, because the pulse may happen to be little, or not at all, accelerated.

After some hours hiccough follows, the pulse becomes so small and quick, as to be counted with difficulty; the breathing laborious; the body is covered by a cold clammy sweat, which is the prelude to delirium, convulsions, and death.

The symptoms occasioned by a protrusion of the Omentum, are sometimes similar to those occasioned by a strangulated portion of Intestine, though generally milder.

Before concluding this branch of the subject, it may be proper to suggest to the younger part of the profession, the necessity of examining with the most sedulous attention, all patients labouring under inflammation of the Intestines, which is frequently brought on by a Hernia, and particularly females, who are sometimes afflicted by a Crural Hernia, which may, on account of the small size of the Tumour, escape the notice of a superficial observer.

Of the State of the Hernia when Gangrene has taken place.

If the patient shall survive the inflammation of the Intestines excited by the strangulation, mortification follows.

When the external parts are gangrenous, there is much reason to apprehend a gangrene of the protruded Intestines, though this rule is liable to some exceptions; for the external coverings of the Hernia have in some cases been healthy, while the protruded parts were in a gangrenous state.

When gangrene has taken place, the pain and tension of the Abdomen and of the Tumour subside; and the Tumour, which had been of a deep red colour, now assumes a leaden hue, is flaccid to the touch, not painful, and retains the impression of the fingers, and sometimes disappears of itself, or on making slight pressure; and the fæces are then discharged by the Anus. Soon afterwards a few black spots appear on the skin, the cuticle separates, and the Cellular substance crackles, being filled with air; and when that has taken place, the skin generally gives way, and a quantity of air and fæces are discharged at the opening.

Sometimes the Intestines have been reduced to a state of mortification, in so short a space of time as twenty hours; and when in that state, are tender and flabby; hence when handled, tear like a piece of wetted paper. There are also frequently vesications upon the protruded parts, the veins of which do not fill again, after the blood is pressed out of them, as coagulation has taken place.

In those cases in which the constriction upon the displaced bowels, as in Crural Hernia, has been very considerable, the Intestines sometimes give way

above the stricture, and their contents escape into the general cavity of the Abdomen, and occasion death in a short time.

In treating of mortification of the Intestines, I have particularly described a case*, in which the contents of the Intestines were for several weeks discharged through an unnatural opening upon the surface of the Abdomen, which is to be ascribed to the Intestines having contracted an adhesion with their parietes, by which the fæces did not get into the cavity of the Abdomen.

Life has also sometimes been protracted, even when mortification has taken place in a strangulated Intestine, and where the fæces pass through an aperture in the protruded Intestine, by the adhesion of that part of the Intestine above the displaced portion with the Parietes of the Abdomen.

After a time, in some cases, the unnatural aperture closes, and the fæces are discharged in the natural way.

I have subjoined the history of a very excellent case of the above description, which was sent to me by Mr A. Burns.

" The patient was middle-aged, and about two years and a half ago, during the delivery of her fourth child, a small and painful Tumour suddenly formed in her left groin. The midwife in attendance, applied a common cataplasm to the swelling, which

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* Vid. Pages 313 and 314.

in a few days suppurated. I have not learned, that the functions of the Alimentary Canal were at this time materially impaired, but when the abscess burst, feculent matter was discharged along with the purulent matter. The food was not fully digested, some of it escaped by the opening at the groin in a half-dissolved state. She became much emaciated, and the debility increased, yet the ulcer in the groin slowly closed, and in the course of less than a couple of months, was completely healed. Afterward, she regained her health, and passed her fæces naturally.

" She, on the recovery of her health, returned to her occupation of beating cotton, but soon found the occupation too laborious. About a year ago, she gave it up, but she still continued sickly, and after fatigue, she was attacked with the usual symptoms of inflammation of the bowels, which in a few days proved fatal.

" On examination, the Peritoneum and Intestines were found coated over with lymphatic exudation, by which the convolutions of the latter were glued to each other. This crust was about a line in thickness, and straw-coloured. When examined, the Peritoneal Coat was finely painted with blood-vessels. The surface of the small Intestines was more affected than that of the large. Besides the lymphatic exudation, there was a quantity of thin purulent matter mixed with pus, lodged in the pelvis. Above the middle of the Ileon, the canal of the gut was much enlarged, and

the Coats of the Intestine were considerably thickened. Below this point, the diameter of the gut was reduced. Between the dilated and contracted parts of the gut, a portion of the Ileon had protruded through the left crural foramen, along with a portion of thickened omentum which lay behind the Intestine. The whole diameter of the gut was not displaced. About four-fifths of it, however, were protruded; hence the direct passage from the part of the Intestine above the protrusion, into the part below it, was not larger than the diameter of a goose quill. Just in contact with the herniated portion of the gut, the upper end was ruptured. Through this vent, which was a few lines in length, the feculent matter, which was found in the pelvis, had escaped. At the mouth of the Sac, on the fore part, the gut adhered to the Peritoneum, and here there was very considerable thickening, and matting of the Coats of the Intestines. That part of the gut exterior to the Abdomen, was consolidated with the integuments at the top of the thigh, and over the point where this consolidation was formed, a pretty extensive cicatrix was found. It marked the place where the ulcer had been situated, through which the feculent matter had formerly been discharged."

The Prognosis is much more favourable when the mortification is limited to a portion of the protruded Intestine, or when the Caput Cæcum only has been displaced, than when it has been of greater extent; but even in the above circumstances, a cure is not

always accomplished, for the inflammatory action, which is propagated rapidly from one part of the Intestines to another, has an effect in deranging, or rather suspending the action of the Intestines, and these become much distended by fæces, which proves an additional and constant source of irritation, and the gangrene, therefore, spreads rapidly from its original seat.

In the case of an unnatural Anus, the nearer the aperture is to the Rectum, the greater the chance of cure; for if the opening be near to the Stomach, the patient is imperfectly nourished, and the food escapes in a half-digested state.

Symptoms of Gangrene occasioned by Strangulation of the Intestines.

When Gangrene has taken place, the patient obtains sudden and great relief, and thinks himself free from danger.

The countenance assumes a leaden hue, the pulse sinks, and becomes interrupted, and so small as to be counted with difficulty: Hiccough, with cold clammy sweats, coldness of the extremities, and death speedily follow.

Some patients suffer a good deal from pain in the Abdomen, as the whole track of the Intestines have not fallen into a gangrenous state.

Of the Hernial Sac covered by a Sac.

This is a very rare peculiarity, and therefore, I have subjoined a plate of it, taken from a preparation which belonged to the late Mr HUNTER.

Plate XII. fig. 2, Represents a variety of that form of disease, which, as far as I know, is not described by any author. It occurred in the person of a woman, who died in consequence of the operation for Hernia. In this instance, a small, or incipient Herniary Sac was found at the side of a much larger one, and in a different state of protrusion, and within the larger Herniary Sac (which was filled with bloody water only), there were two smaller Herniary Sacs, so that there are four distinct Sacs.

When the operation was performed, it was necessary not only to cut through the larger Sac, but also to divide the smaller Sacs, before the Intestines were exposed.

Mr HUNTER in his Catalogue, when describing this preparation, observes, " that it strongly illustrates one or other of the following circumstances: either the mode in which an Hernia is formed, or the process by which an old Hernia is cured."

But which of these processes was going on, is very difficult to determine, as the previous history of the patient is not given in Mr HUNTER's Catalogue.

Such was the account of the case of Mr HUNTER,

which was published in my Observations on Crural Hernia.

Since that time, Mr Astley Cooper has published his very useful and splendid volumes upon Herniæ; in which he observes, "that he had discovered, that the Sac of the Crural Hernia is frequently covered by what he has called a *Fascia Propria*," and in a letter which I received from him a few months ago, he has observed, "that in the case which you described from Mr Hunter's Museum, the *Fascia Propria* is raised up from the Sac:" he adds, "I have looked at the preparation again and again, and am sure of the fact."

Of Diverticula, or unnatural Appendices connected with the Intestines.

By the term Diverticulum, is to be understood, a process or blind Sac, connected with the side of the Intestinal Canal. Vid. Plate XIV. fig. 2.

One or more of those processes, which are of different lengths, are sometimes connected with the Intestines; and such a process is also frequently found within the Sac of a Hernia, especially in cases of a Crural Hernia.

These processes freely communicate with the cavity of the Intestine, excepting where inflammation has given rise to the accretion of their opposite sides.

There has been much difference of opinion as to

the manner in which the unnatural appendices to the Intestines are formed.

That the preternatural appendices occasionally found within the Sac of a Hernia, are generally formed in the manner which has been described by my Grandfather, viz. by the stretching out of the sides of the Intestines, and probably also by the addition of new matter, seems to me to be obvious, from the following circumstances.

Supposing that even several such appendices were attached to the Intestinal Canal of a patient afflicted by Hernia *, it is not probable, that that particular part to which the appendix is connected, which bears but a small proportion to the whole of the Intestinal Canal, should get into the Hernial Sac.

In different species of Herniæ, and even in different cases of the same species of Hernia, more or less of the Intestinal Canal fills the Hernial Sac; sometimes only half the diameter of the Canal.

When a complete convolution of the Intestinal Canal has been protruded, the distention and vermicular motion of the Intestines, (provided there be no adhesion between the Hernial Sac and its contents), favour the return of the bowels into the Abdomen. But after the partial adhesion between the Hernial Sac and its contents, the vermicular action of the In-

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* Of which there are several specimens in the Museum of the University.

testine cannot then have the same effect; the adhering part must be stretched more and more, and is in time extended into a Cul de Sac of some length; more especially in those Herniæ in which the Intestines (as in the case of Crural Hernia), pass through a narrow Canal with unyielding sides.

There is also a species of appendix which is different from any of the preceding; it has a much thinner covering, is of a globular form, and is shorter and wider than the preceding species.

It seems to me to be formed by a protrusion of the Villous Coat, through the other Coats of the Intestines.

A specimen of this variety was sent to me by Dr Cheyne of Leith, who found it connected with the middle of the Rectum of a patient who had died from acute inflammation of the Intestines.

The symptoms occasioned by such diverticula included within the Hernial Sac, are in some instances somewhat different from those occasioned by pressure made upon a turn of Intestine which has been protruded. My Grandfather has observed, " that instead of an entire piece of Intestine being thrust out, *one side of a gut has been stretched out into an appendix cæca ;* when this happens, the ingesta will not be stopped in their passage towards the Anus, and the patient will go to stool, even though a strangulation of the Hernia should come on: whereas, when the whole diameter of the gut is straitened by a strangulation, the ingesta will be stopped at the

Hernia, after the Guts below it are emptied; the patient passes no more fæces, and the ingesta regurgitate towards the Stomach, and are vomited."

But even when the Diverticulum only is contained within a Hernial Sac, it sometimes happens, (as in the case from which figure 2d of Plate XIV. was taken), that a very violent inflammation, which spreads from the Diverticulum to the contiguous Intestine, has been excited, which proves fatal.

As the unnatural process does not constitute an essential part of the Intestinal Canal, it may be cut off, where it fills the Sac of a strangulated Hernia. Dr Wardrop did so in a case of this description, and after the operation, the patient went to stool, and had a complete recovery. But inflammation excited in the appendix to the Intestine, may in some cases extend to the rest of the Intestinal Canal, and may prove fatal, and the death of the patient in such an instance, is not to be imputed to an inflammation excited by a strangulation of the Intestine, but to inflammation excited by the removal of the Diverticulum.

Of the Prognosis.

In every species of Hernia, the Prognosis is unfavourable, in so far, at least, as relates to the complete recovery of the patient.

During infancy, the disease has often been cured by pressure alone, especially in cases of Umbilical

and Congenital Hernia in children, as there is then a disposition in the Umbilical and Inguinal apertures to contract; but in advanced life, a complete cure is rarely accomplished in this way; and even when the disease has, in appearance, been removed, it is apt to recur.

It is, therefore, from a chirurgical operation only, that persons of a certain age can expect a perfect cure. But though the disease is in general only to be palliated, it seldom proves fatal, unless from accident or neglect, because the Hernia can generally be returned and retained by proper pressure.

The danger of the Hernia depends upon the cause of the disease, the peculiar constitution, and time of life of the patient; the kind and size of the Hernia, and the nature of the bowels which fill the Tumour, and the length of time which has elapsed since the strangulation has happened.

Hernia, occasioned by some great exertion during the prime of life, proves more dangerous than when it occurs during infancy or old age; for in the former, there exists no predisposition to the disease, and the aperture being small, the displaced bowel must be much compressed and twisted, and sometimes is strangulated at the moment of its displacement; inflammation therefore immediately follows, which runs high, and terminates speedily in mortification; whereas, the relaxation of infancy and old age, which gives a predisposition to Hernia, proves to a certain

degree a safeguard against strangulation and its consequences: beside, the circulation being languid, there is less disposition to inflammation.

The danger of Herniæ is proportioned to the size of the aperture through which the bowels are protruded; hence the great danger of the Femoral Hernia; and as the same aperture is not equally capacious in the male and female, the Inguinal Hernia, to which men are most exposed, proves more dangerous to the female, and the Femoral Hernia, to which women are most liable, to the male: the sex of the patient, therefore, should be taken into consideration.

The size of the Hernia also has an influence upon the Prognosis; Herniæ of considerable size being much less formidable than the small recent ruptures, there being much less risk of strangulation on account of the weakness and size of the aperture through which the bowels have passed; the aperture gives way on slight pressure being applied, and the bowels are not compressed, and hence not liable to inflammation.

The danger of this disorder is also modified by the nature of the contents of the Tumour. Pressure made upon a portion of Intestine, is much more dangerous than pressure upon a part of the Omentum; the functions of the former being more essential to life.

Pressure made on the Omentum is not attended

with immediate danger, unless it be so great as to impede the free circulation of blood through the protruded portion, which produces mortification, and, in some examples, the death of the patient.

Protrusions of the Omentum are to be regarded with a suspicious eye; as when that organ gets into a Hernial Sac, it cannot, even when recently protruded, be readily returned, as it adapts itself to the shape of the parts through which it has passed; and when long displaced, becomes irreducible, on account of its increased bulk.

The Omentum, therefore, often paves the way for a protrusion of a portion of Intestine; and owing to an adhesion of the Omentum to the neck of the Hernial Sac, pressure cannot be applied with advantage; and in these cases, the APERTURES are commonly so much enlarged as to preclude all danger of strangulation.

In short, in the Acute Hernia, there is always great danger, if the bowels cannot be immediately returned, as inflammation and its fatal consequences so quickly and so certainly follow; and, in Chronic Hernia, the complaint has been known to terminate fatally, from stricture of the Intestine, when very little pain or inflammation had been induced, and where the medical attendants had, from such circumstances, been lulled into a fatal security.

Of the Diagnosis between Inflammation of the Bowels, and that occasioned by Strangulation from Hernia.

It may not be improper to add, before concluding the general observations on Hernia, that when a patient, with an irreducible Hernia, is afflicted with an inflammation of the bowels which are within the Abdomen, it may be mistaken for the inflammation occasioned by the strangulation of that portion of the Intestine within the Hernial Sac.

Mr Pott has published two cases, which throw much light upon this branch of the subject, from which I have made short extracts.

The first case was that of an old gentleman, who had an irreducible Hernia. "He complained of great pain in his whole belly, but particularly about his navel; he was hot and restless, and had a frequent inclination to vomit; his pulse was full, hard, and frequent; and he had gone, contrary to his usual custom, three days without a stool.

"I examined his rupture very carefully; *the process was large and full, as usual, but not at all tense or painful upon being handled;* his belly was much swollen and hard, and he could hardly bear the light pressure of a hand about his navel. Upon mature consideration of the whole, I was of opinion, that his rupture *had no share in his present complaints.*"

Notwithstanding the opinion of Mr Pott, the operation was performed, and the patient died on the 6th day. Upon dissection, "the Hernial Sac

was thick and hard, and contained a large portion of Omentum, a piece of the Ilium, and a portion of the Colon, *all perfectly sound, free from inflammation or stricture, and irreturnable only from quantity.* But the Intestine Jejunum was greatly distended, highly inflamed, and in some parts sphacelated."

The second case was similar; a patient had a rupture, and was seized with the symptoms denoting strangulation. Mr Pott observes, "that the rupture was on the right side, was clearly Intestinal, was soft, easy, occasioned *no pain upon being handled*, and seemed to be capable of reduction; but, after many trials, I found that I could not accomplish that end, notwithstanding I used my utmost endeavours; all which gave the man *no uneasiness*, and therefore satisfied me, that his symptoms did not *arise from his Hernia*, which was also the patient's own opinion."

The operation was performed also in this case.

The Ilium which had been protruded, was "*so perfectly free from stricture, that, when he had loosened it from its connection, we returned it into the belly without dividing the tendon.*

"I was indeed afraid that the man would have died before we could have got him to bed, but he lived till the next day.

"A portion of the Colon within the belly had been in a state of inflammation, was now plainly mortified, and quite black."

Of Abdominal Herniæ.

Having premised such general observations as seem necessary for elucidating the nature of Hernia in general, I shall now endeavour to describe the anatomy of the parts concerned in this disease. Thus an accurate knowledge of the situation of the Tumour—of the various causes which oppose a mechanical resistance to the return of the prolapsed bowels—of the cause of the greater frequency of some Herniæ among men than women—of the safest and surest method of removing the disease by pressure, or by a Chirurgical operation; and also a means of preventing a return of it, is gained.

The subsequent description supposes the body to be in the erect posture, and in the healthy state.

The structure of the Parietes of the Abdomen is very beautiful though complicated, and admirably calculated to prevent a protrusion of the contained bowels.

Of the Superficial Fascia.

Upon removing, with care, the skin of the belly, a thin fascia, or rather membrane, presents itself, which has been said by some to take its rise only from the inferior part of the tendon of the external oblique Muscle, and has been described by Camper.

It rarely exhibits a fibrous appearance in the adult, and the fibres, when distinct, pass in a transverse direction with respect to the Abdomen. These fibres do not resemble tendinous fibres, being neither to the eye glistening, nor communicating to the touch the same dense feeling as tendon.

This membrane is proportionally thicker in the fœtus.

This fascia, which has always appeared to me to consist of condensed Cellular substance, covers the Spermatic Cord and round ligament of the Uterus, and also some of the Inguinal Glands of the upper and under cluster; and may, in some subjects, at the upper part of the thigh, be divided into layers, between which some small Lymphatic Glands are placed.

In a few cases, it may be readily traced for six or eight inches down the thigh.

This membrane, in some cases of Scrotal Hernia, attains a very considerable thickness; in others, it adheres so intimately to the Hernial Sac, that it is impossible to separate the one from the other.

Of the External oblique Muscle of the Abdomen.

This Muscle originates by eight, sometimes by nine heads, which are in some measure like to right angles, from the eight or nine lowest ribs, and not at a great distance from the Cartilaginous parts of the ribs.

The upper head adheres to the origins of the Serratus Anticus Major, and the lower to the Latissimus Dorsi.

All the heads adhere to the neighbouring Intercostal Muscles.

The different heads of the oblique Muscle are greater in breadth than in thickness.

The fibres of the Muscle proceed obliquely forwards and downwards, and terminate in a thin tendinous Aponeurosis.

The upper part of the Muscle passes transversely across the body, and is connected by its tendon to the lower part of the larger Pectoral Muscle.

The tendons of the external oblique Muscles of opposite sides unite with each other, and with the tendons of the internal oblique, and form a distinct white line in the middle of the body, which extends from the Cartilago Ensiformis to the Pubis.

The larger fibres of the tendinous Aponeurosis attached to the lower portion of the external oblique Muscle, descend obliquely inwards and downwards, are disposed in a parallel manner in respect to each other, and between these there is a much thinner tendinous substance.

The larger tendinous fibres of the external oblique Muscle are united together by means of many thin tendinous fibres, which take their rise from the Crural Arch.

These smaller connecting fibres are by no means equally manifest in every instance, being in some

persons very small, and flattened; but in others, distinct, thick, and rounded Cords, and in Hernia, sometimes become very large, and make a distinct impression on the Hernial Sac*.

Sometimes these connecting fibres are entirely wanting.

The under part of the tendon of the external oblique Muscle, stretched between the anterior superior spinous process of the Ilium, and the Symphysis Pubis, is thicker and stronger than any other part of it, and somewhat rounded, especially towards the Ossa Pubis, and has been described under the name of Poupart's Ligament; and more lately it has been called by Anatomists *Crural Arch*, as it extends over the flexor Muscles, great blood-vessels, and nerves of the Thigh.

This under part of the tendon was formerly supposed to be attached only to the anterior superior spinous process of the Ilium, and the ligament of the Symphysis Pubis.

Mr Gimbernat has, however, shewn, that the tendon is doubled inwards, and forms a Canal for the Spermatic Cord in the male, and for the round Ligament of the female Uterus.

Poupart's ligament, or the Crural Arch, is sometimes double. I have seen two such ligaments on each side. When that is the case, the one ligament

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* Vid. Plates of Inguinal Herniæ by Camper.

is generally fixed about a line above the tubercle of the Pubis, and the other is found in its usual situation.

About an inch, or a little more from the Symphysis Pubis, the tendon of the external oblique Muscle is generally divided into an upper and under column, but in some instances, the division takes place at a greater distance from the Symphysis Pubis. Between the tendinous columns, which are connected at the upper part by a few transverse tendinous fibres, a space intervenes, which is somewhat of an oval figure, which has been commonly called the Spermatic Ring; but this term conveys an inaccurate idea of the form of this aperture, and it should be called Inguinal or Abdominal Aperture, and with the addition of the word *Under*, to distinguish it from the *Upper* Inguinal or Abdominal Aperture.

Through the Under Abdominal Aperture, the Spermatic Cord passes; and in the female, the round ligament of the Uterus: and there is no direct opening into the Abdomen, the passage being shut up by the internal oblique, and transverse Muscles, and by the Fascia Transversalis.

The Under Abdominal Aperture in the male, is somewhat curved above, angular below, and directed obliquely downwards and inwards, and the sides of it are thicker than its upper or under part, being formed of the straight fibres of the tendon; whereas, the thinner tendinous substance, which connects the thicker fibres of the tendon, forms the

upper part of the aperture. In the male, the UNDER INGUINAL APERTURE is about an inch in length, but in the female, it is rather longer, and also narrower.

To the upper column of the tendon of the external oblique Muscle, which forms the UNDER ABDOMINAL APERTURE, a thin portion of tendon is fixed, which passes downwards, and is attached to the Gluteus maximus and Triceps adductor Muscle of the Thigh, which has also been observed by CAMPER, and represented by him in one of his excellent Plates of Hernia: this, by embracing the Spermatic Cord, proves in some measure a barrier against Hernia.

The upper part of the tendon of the external oblique Muscle, passes obliquely downwards and inwards, and is in part fixed to the ligament of the Symphysis Pubis of the same side, and also to that part of the ligament of the opposite side decussating in its course the tendinous fibres of the external oblique of the opposite side, so that some of the tendinous fibres of the right side terminate in the left Os Pubis.

The portion of the tendinous Aponeurosis forming the under part of the UNDER ABDOMINAL APERTURE is folded under the Spermatic Cord, and round ligament of the female, and passes inwards, and is inserted into the spinous process of the Os Pubis, and Linea Ilio-pectinea, (a term used by my Grandfather in his Osteology,) for the space of about an inch, or a little more.

Some have described this insertion of the under column as a distinct ligament.

In the erect posture, this part of the tendon of the external oblique is placed almost horizontally, and is much deeper than the upper part of the tendon.

The upper and under parts of the tendon of the external oblique Muscle, are widely different in another respect; the upper and outer is a thick rounded Cord, extending from the Spine of the Os Ilium to the tubercle and Symphysis of the Pubis; the under is reflected backwards and inwards, and is extended over the femoral blood-vessels, and its posterior edge is very thin.

The Crural Blood-vessels, Lymphatics of the inferior extremities, the Internal Iliac and Psoas Muscles, and the protruded bowels, in cases of Crural Herniæ, pass behind the Crural Arch.

Anatomical description of the Internal Parts in the Male.

Upon removing the Peritoneum which lines the Abdominal, Iliacus Internus, and Psoas Muscles, the Umbilical Arteries changed into ligaments, and the Urachus come into view. The Spermatic vessels are also exposed, and these sweep along the brim of the Pelvis, over the surface of the Iliacus internus Muscle; and upon reaching the upper Abdominal aperture, the Vas Deferens is added. The Spermatic

Cord thus formed, then passes obliquely downwards and forwards, along the lower part of the internal oblique and transverse Muscles of the Abdomen in its course, receiving from the internal oblique the Cremaster Muscle; and then, at the UNDER ABDOMINAL APERTURE, it suddenly forms an angle, which covers the insertion of the outer tendinous column of the external oblique Muscles into the Pubes, and then passes directly into the Scrotum.

This peculiar course of the Spermatic Cord has been very faithfully represented by VESALIUS, in the wooden plates affixed to his book, and also by ALBINUS. It was reserved for Mr ASTLEY COOPER, to detect and describe the UPPER ABDOMINAL APERTURE, which may be perceived by introducing the finger into the UNDER ABDOMINAL APERTURE, and by pushing it upwards in the direction of the Anterior Spinous process of the Ilium; the borders of the UPPER APERTURE may then be perceived about an inch nearer to the Anterior Spinous process of the Os Ilium, than the UNDER APERTURE, the borders of which are in part formed by the internal oblique and transverse Muscles, and by the Fascia Transversalis.

The Inguinal Canal of the adult follows an oblique course, and about an inch intervenes between the UPPER and UNDER APERTURES of that Canal. The upper part of this Inguinal Canal, called UPPER ABDOMINAL INTERNAL APERTURE, is formed by the transverse and internal oblique Muscles, and the

Fascia Transversalis, and the EXTERNAL or LOWER ABDOMINAL APERTURE is formed by the disunion of the tendon of the external oblique Muscle.

In the fœtus, the Spermatic Cord passes *directly* through the Parietes of the Abdomen.

The internal or posterior part of the Crural Arch is always distinct; it is marked by a white line in the tendon, which extends from the Anterior Spinous process of the Os Ilium to the Linea Ilio Pectinea, and feels like a tense Cord when the limb is extended, but when the thigh and leg are raised to nearly a right angle with the body, the internal edge of the Crural Arch is thrown into a state of relaxation, which position is favourable not only to the displacement of the bowels, but also to the replacing the bowels when protruded. A continued tendinous membrane lines the internal parts: for the internal or posterior margin of the Crural Arch, is intimately interwoven with the tendinous fascia, which covers the Iliacus Internus and Psoas Magnus Muscles, which is connected to the Crista of the Ilium, to the Linea Ilio Pectinea and Ligament of the Pubis, also with that fascia, or rather membrane, which covers the transverse Muscles, as far as that part of the thigh where the anterior Iliac Artery and Vein emerge from the Pelvis: Thus the Crural Arch is firmly bound down, and the bowels can be protruded only through the Crural aperture.

Of the Crural Sheath.

A part of the Iliac Fascia passes behind the Crural vessels, and is firmly united to the Pubal part of the Fascia lata, forming the posterior part of the Crural sheath, and the Crural vessels are covered anteriorly by the Fascia Transversalis, Crural Arch, and Cellular substance. Thus the beginning of the Crural Sheath is formed, and the above Fasciæ unite at the sides, and form the lateral portions of the sheath.

The Anterior Iliac Artery and Vein are closely enveloped by the same kind of Cellular sheath as the other Arteries and Veins of the body; which sheath is firmly fixed to the inner edge of the Crural Arch by short Cellular threads, and between the Artery and Vein there is a distinct division.

Of the Crural Aperture.

On the side of the Anterior Iliac Vein, next the Pubis, there is an aperture called Crural, somewhat of an oval figure, and considerably larger in the female than in the male, which is generally filled by a Cribriform Membrane, through which the Lymphatics of the inferior Extremities enter the Pelvis, and sometimes, though very rarely, by a membrane, which has somewhat of a ligamentous nature, and sometimes by Lymphatic Glands, and according to

Mr Cooper, also by a portion of the Fascia Transversalis.

On the fore-part of the Crural Aperture, the Crural Arch is placed, behind, the Pubes; and on the Pubal side of it, the thin border of the internal part of the Crural Arch, sometimes called Gimbernat's Ligament, or the third insertion of the external oblique Muscle, by Mr Astley Cooper. Vid. Plate XIII. fig. 1.

There is considerable difference as to the size of this aperture in the Male and Female; it is considerably larger in the latter, owing to the greater size of the bones of the Pelvis, to the smaller size of the Iliacus Internus and Psoas Muscles, and owing chiefly, as I discovered, to the greater narrowness of the internal part of the Crural Arch, fixed into the Pubal part of the Linea Ilio Pectinea, as is obvious, by comparing fig. 2, of Plate XV. Vid. letter N., with Plate XIII. fig. 1, Vid. letters c, d.

Of the Fascia Transversalis.

The attention of Anatomists has been lately drawn to a thin Fascia *, which is seen upon removing the Peritoneum, which lines the Abdominal Muscles,

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* I have described this Fascia Transversalis, and upper Abdominal aperture, as in the parts dissected, which Mr Astley Cooper sent to me.

which was discovered by Mr Cooper*. This Fascia lines the under part of the transverse Muscle of the belly, is connected with the inner or posterior part of the Crural Arch, and then ascends for four or five inches upon the Transversalis Muscle of the Abdomen, upon the surface of which it is gradually lost.

This fascia serves two important purposes: it shuts up the direct passage into the cavity of the belly, behind the under Abdominal aperture, and by dividing into an Ilial and Pubal Portions, forms in a great measure the upper Abdominal aperture.

This Transversalis Fascia is so dilatable, that in Herniæ of some standing, the upper aperture is nearly opposed to the under aperture.

There are some fibres from the under column of the external oblique Muscle, which strengthen the back part of the Inguinal Canal.

Of the Fascia Lata of the Thigh.

The Muscles of the Thigh are covered by a strong tendinous aponeurosis, called Fascia Lata, which takes its rise from the outer rounded portion of the Crural Arch, from the Spine of the Ilium, and from the Pubis.

Beneath the Crural Arch, (supposing the body to

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* Mr Cooper has acknowledged, that, in some instances, it is merely condensed Cellular substance.

be erect), an oval-shaped depression may be perceived on the fore, and rather on the inner part of the thigh, on the surface of the Pectineus Muscle, which is bounded by a well-defined tendinous border, except at its inner edge.

The situation of the above-mentioned depression, merits notice, as marking the situation of Crural Hernia. In the Fascia Lata, there is an aperture through which the Vena Saphena Major passes, to join the Femoral Vein, the borders of which aperture are covered by fat, Cellular substance, and Lymphatic Glands. The Fascia Lata has been described as being composed of two distinct portions: one of which covers the upper and outer part of the Thigh, and is connected with the larger share of the Crural Arch, between the Anterior Spinous process of the Os Ilium and Tubercle of the Pubis, and may be called *Ilial* portion, and the other, which arises from the Pubes, *Pubal* portion. Where the Iliac part of the Fascia Lata ceases to be united to the Crural Arch, it forms a fold of the shape of a sickle, the concavity of which looks downwards and inwards; which was first accurately described by Mr Burns of Glasgow, and called by him the falciform process of the Fascia Lata; and this covers that portion of the Femoral Artery and Vein which is found immediately under the Crural Arch, and the under part of the Iliacus Internus, and Psoas Muscles.

The other, or *Pubal part*, which is thinner than

the *Ilial portion* of the tendon, arises from the Pubes, and covers part of the Pectineus and Triceps Muscles, and is united with the *Ilial* part beneath the Vena Saphæna Major, where that vein joins the Femoral Vein.

Of the situation of the neighbouring Blood-vessels in respect to Inguinal and Crural Herniæ.

The situation of the Arteries and Veins, in respect to the Hernial Tumour in an especial manner, claims the attention of the Surgeon.

The Epigastric Artery generally arises from the Anterior Iliac Artery, and passes behind the Spermatic Cord, on the side of the upper Abdominal aperture, next the Pubis, in its course to the posterior part of the Rectus Muscle; the Epigastric Artery must therefore be first behind, and then on the Pubal side of the most common kind of Inguinal Herniæ.

Camper, in his excellent Observationes Pathologicæ, has accurately described the situation of the Epigastric Artery and Vein, in respect to the Hernial Tumour; and has added, that from the duration of the disease, these vessels are pushed nearer to the Pubes; "in Herniis inguinalibus, Arteria et Vena Epigastrica versus pubem a prolapsis Intestinis compellunter."

But the Epigastric Artery is also sometimes situated on the opposite or Ilial side of the Tumour,

as has been observed by DESAULT, CHOPART, SABATIER, CAMPER, and ROUGEMONT.

Plate XV. fig. 1st, exhibits an inside view of the Pelvis of a woman, who died in consequence of Crural Hernia. The Epigastric and Obturator Arteries have a common origin, as marked by letter F; the Epigastric Artery, marked K, is seen upon the Ilial side of the neck of the Crural Hernia.

Plate XIV. gives an outside view of the body of the same woman, in which the farther course of this Artery, and its situation in respect to the Herniary Sac may be traced, the portion of the Abdominal Muscles that covered it having been purposely removed.

The Epigastric Artery appears about half an inch nearer the anterior superior spinous process of the Ilium, than the neck of the Sac, then passing obliquely inwards and upwards, to the Rectus Muscle of the Abdomen.

The Epigastric Artery does not always take its rise from the same part of the Anterior Iliac Artery within the Pelvis.

I have seen the Epigastric Artery and internal Circumflex of the Pelvis come off from the Anterior Iliac, by a common trunk within the Pelvis, and very near to the Crural Arch.

The Epigastric Artery sometimes arises from the Pudic Artery; I have also seen it arising from the Arteria Profunda Femoris. In some cases, a branch

of the Epigastric Artery passes through the Inguinal Canal, and anastomoses with a small branch sent off from the Femoral Artery.

When the Epigastric Artery takes its usual origin from the Anterior Iliac Artery, its smaller branches in some cases pass along that part of the Crural Arch called GIMBERNAT's Ligament, in their course to the Symphysis Pubis.

I have a specimen in which the Epigastric Artery takes its rise from the obturator, and passes upwards and inwards to the Rectus Muscle.

Besides the Epigastric Artery, there is another Artery which is in danger of being wounded in performing the operation for Crural Hernia.

I allude to the Obturator Artery, which commonly arises from the posterior Iliac Artery; but sometimes, as in fig. 1st, Plate XV. takes its origin in common with the Epigastric Artery from the Anterior Iliac.

The trunk common to the Obturator and Epigastric Arteries, is sometimes a quarter of an inch in length, as in fig. 1st of Plate XV.; in other instances, it measures from an inch to an inch and a half, and I have met with it of all intermediate lengths.

If the common trunk be only a fourth of an inch long, the Obturator Artery runs on that side of the Sac, which is next to the Anterior Spinous process of the Ilium, and cannot be displaced; being firmly bound down by Cellular substance, and therefore,

cannot be injured, in that kind of Crural Hernia, in which the displaced bowels are lodged within the sheath of the Lymphatic vessels, by dividing that part of the Crural Arch next the Pubes, in the manner recommended by Mr GIMBERNAT.

On the other hand, it frequently happens, when the Obturator arises in common with the Epigastric Artery, that a third branch, nearly of equal size with the Obturator, takes it rise from the common trunk. This may be called the Artery of the Internal part of the Crural Arch; for it runs on the inner side of the Crural Arch, passes across GIMBERNAT'S Ligament, and when it reaches the Symphysis Pubis, then divides into a number of small branches which are distributed upon the inner side of the Symphysis Pubis.

It also merits mention, that a small Artery, or two or three small branches, are sometimes sent off from the Obturator, in its course from the common trunk to the Foramen Obturatorium, which are distributed upon that part of the Crural Arch, called GIMBERNAT'S Ligament, and which may be divided in performing the operation for Crural Hernia, as recommended by Mr GIMBERNAT.

When the trunk common to the Obturator and Epigastric Arteries is of an inch, or an inch and a half in length, the Obturator Artery is then situated between the Symphysis Pubis and the Hernial Sac, and sometimes follows the same course as that part

of the Crural Arch called GIMBERNAT's Ligament, of which I have seen several examples.

Mr JAMES WARDROP, is, I believe, the first who has described such a distribution of Arteries in the case of Crural Hernia. In that instance, the Obturator Artery arose from the same trunk as the Epigastric Artery, and then passed on the Pubal side of the neck of the Hernial Sac, and described a semicircle around the neck of the Sac.

Baron HALLER, LIEUTAUD, RICHTER, and MURRAY of Upsal, have described such an unusual origin of the Obturator Artery, but do not make mention of the proportion of cases in which it occurs.

I have paid a good deal of attention to this department of Anatomy: In my Observations on Crural Hernia, (published in 1803), I have stated, that I had not observed such a deviation from the usual distribution of the Arteries in above one of 25 or 30 cases; and according to subsequent observation, such a distribution of Arteries occurs in one of 20 cases. I have also observed, that the short division is as common as the longer; and as the Obturator Artery is only in danger of being divided by GIMBERNAT's operation in the latter case, (indeed Mr COOPER asserts, that he had never met with the Obturator Artery passing around the neck of the Hernial Sac), hence such an unusual distribution of the Obturator Artery does not form so material objection to the operation for Crural Hernia, performed

according to the method of GIMBERNAT, as has been supposed.

There is still another variety as to the distribution of the Epigastric and Obturator Arteries; these Arteries in some cases come off from the Anterior Iliac Artery by separate trunks; and the Obturator Artery passes around that part of the Crural Arch called GIMBERNAT'S Ligament, and is attached to it by Cellular substance. When this happens, the Obturator Artery, by the descent of a portion of the Intestine through the Crural Ring, is pressed upon the very part of the Crural Arch divided by GIMBERNAT, in his operation for Crural Hernia.

I have seen the Obturator Artery sent off from the external Iliac Artery, about an inch and half above, and in others, about an inch below the Epigastric Artery; and in other cases, even on the outer side of the Pelvis, from the superficial Femoral Artery; in which case, the Artery ascends along the Pectineus Muscle, and enters the Pelvis at the Crural Aperture. The Artery in this case is placed behind the Crural Hernia.

I have made particular mention of all the varieties as to the origin and course of the Epigastric and Obturator Arteries, and of their branches, which have fallen under my observation, as these Arteries are of considerable size, and when divided in the time of performing the operation for Crural Hernia, have poured out so much blood as has proved fatal; for

on account of their deep situation and retraction, it is extremely difficult to secure these by Ligature.

Even wounds of the smaller branches of the Epigastric Artery sometimes prove fatal.

Dr Carmichael Smyth * has related the histories of two such cases, and makes mention of other similar cases, which were communicated to him, in which the patients lost their lives, by a wound made in the Epigastric Artery, in performing the operation of tapping for the dropsy in the belly.

There is another Artery, which, from a variety as to its mode of distribution, may be divided in performing the operation for the Crural and Inguinal Herniæ.

I allude to the Arteria Circumflexa Ossis Ilii, which takes its rise within the Pelvis, from the anterior Iliac Artery, and opposite to the Epigastric Artery. I have seen a branch of this Artery nearly as large as the Epigastric, pass under the Crural Arch, about two inches from the Symphysis Pubis, and it then divided into branches, which were distributed upon the Symphysis Pubis, the fat and skin over the Crural Arch, whilst other small branches were distributed upon the Ilial portion of the Fascia Lata of the Thigh.

The peculiar course of the Veins also merits attention. A plexus of Veins is sometimes placed on

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* Vid. London Med. Communic.

GIMBERNAT's Ligament; a good deal of blood may be lost by wounding these, and especially as they run on the inner side of the Crural Arch, and therefore the bleeding could not be stopped by pressure.

The Obturator Vein generally accompanies the Obturator Artery, and therefore may be divided at the same time as the Artery, in performing the operation for Crural Hernia, as recommended by GIMBERNAT.

Mr A. BURNS of Glasgow, lately shewed me a case of Crural Hernia, in which a large Vein passed along the inner part of the Crural Arch, and received the Epigastric Vein. In this case, if the division of the Crural Arch had been made directly upwards, as has been recommended, that large Vein must have been divided, and, on account of the size of the Vein, a great quantity of blood might have been lost.

From the preceding description of the Parietes of the Abdomen, it follows,

1st, That as the hollow bowels of the Abdomen are in immediate contact with the Peritoneum lining the Abdominal Muscles, there must be a constant action and reaction between the containing and contained parts; and hence, that any cause which increases the pressure of the contained bowels, or diminishes the resistance of the containing parts, may give rise to Hernia.

2dly, That as the contents of the Abdomen are placed between two compressive forces, the Abdo-

minal Muscles and Diaphragm, which act alternately or conjunctly upon these, that any violent action of the former, or of the latter, or the inordinate combined action of both, may occasion a displacement of the bowels of the belly; hence Hernia is frequently occasioned by violent coughing, straining at stool, blowing wind instruments, &c. and especially by lifting heavy weights, as then the Muscles exert themselves with a great force when the body is bent, and when the Parietes of the Abdomen are at the same time relaxed.

3dly, That if the Peritoneum lining the Abdominal Muscles be not ruptured, it forms the Hernial Sac, as it must be pushed forwards before the bowels which have been displaced.

4th, As the Parietes of the Abdomen do not give the same degree of support to their contents where the Spermatic Cord, round Ligament of the Uterus, and the Crural Blood-vessels pass outwards, the bowels are protruded at such places, and the frequency of the protrusion bears a ratio to the size and direction of the Aperture in the Parietes of the Abdomen.

From the greater size of the Inguinal Canal of the male, men are more frequently afflicted by Inguinal Herniæ, and the disease is more dangerous to women, there being, on account of the smaller diameter of the Inguinal Canal, a greater risk of strangulation.

5th, That the Spermatic Cord and round Liga-

ment of the Uterus, which are imbedded within the Inguinal Canal, cannot be compressed during the action of the Abdominal Muscles, owing chiefly to the peculiar manner in which the under tendinous column of the external oblique Muscle is folded beneath the Spermatic Cord, and fixed to the Linea Ilio Pectinea.

6th, That the oblique course of the Spermatic Cord and round Ligament of the adult, proves a great barrier to the protrusion of the contents of the Abdomen and Pelvis, as it serves in some measure the office of a Valve; but as the UPPER APERTURE is immediately opposite to the UNDER APERTURE in an infant, infants are much more exposed to the Herniæ at the groin than adults.

7th, As the space of about an inch intervenes between the UPPER and UNDER ABDOMINAL APERTURES, the Intestines may not always pass through the UNDER INGUINAL APERTURE, but may be arrested in their course downwards between the UPPER and UNDER APERTURES; and in these circumstances, the Tumour is not external to the Parietes of the Abdomen, and but of a small size, the Inguinal Canal not admitting of much extension.

8th, That the phrase stricture at the UNDER ABDOMINAL APERTURE, which has been employed even by the most celebrated Surgeons, may convey an incorrect idea of the cause of the strangulation in cases of Herniæ; for it implies, that the Spasmodic con-

traction of the tendinous bands of the external oblique Muscles occasions the strangulation.

Mr Pott remarks, "that the mere stricture made by the tendon in the generality of incarcerated rupture, is not only a sufficient, but the primary, and indeed sole cause of the symptoms, and of all the mischief;" an opinion which may lead to the supposition, that tendons are capable of contraction on the application of a Stimulus.

But tendons possess no contractile power, and if the size of the Under Abdominal Aperture had been diminished by the Spasmodic contraction of the external oblique Muscle, this must have been felt by the patient, or by any one who examined it.

The tendon is not the active cause, the pressure is occasioned by more of the Intestine or Omentum being forced into the Under Abdominal Aperture, than can lie there without being much compressed, and the mischief does not result from the Aperture being less, but from its contents being greater; for when the bowels have been suddenly protruded, where there is no predisposition to Hernia, the tendinous columns of the Under Abdominal Aperture, cannot receive the bowel or bowels which are out of the Abdomen, without making great and dangerous pressure upon these.

And in a rupture of some duration, even where the Inguinal Canal has been extended—where an extraordinary portion of the Intestines has, from any cause, been forced down, the strangulation is not

occasioned by the spasmodic contraction of the tendinous columns of the external oblique Muscle.

The remedies that are usually employed with the greatest success for the cure of Herniæ, afford an additional argument in favour of the above opinion.

Supposing the strangulation to be owing to the contraction of the tendinous fibres of the UNDER INGUINAL APERTURE, or of the CRURAL APERTURE, the application of cold water, vinegar, snow, or ice, instead of removing the disorder, (which they certainly sometimes do), should, by bringing on a greater degree of contraction in the TENDINOUS APERTURES, render the disease still more obstinate; whilst, on the other hand, warm fomentations, which induce relaxation, should always prove an antidote to the disorder, whereas they do much more harm than good, for by rarifying the air within the protruded Intestine, they add to the bulk of the Tumour, and aggravate the disease.

Where the bowels are strangulated at the NAVEL, or at the UNDER ABDOMINAL APERTURE, it seems to me to be owing to the bowels being stretched, twisted, and inflamed, and forced into a part, where there is not a sufficient cavity for their reception, and to their bulk being increased by an effusion of Lymph upon their surface, between their Coats, or within their Cavity.

9th, That the strangulation at the UPPER ABDOMINAL APERTURE, may be occasioned either by the fascia of the transverse Muscle, or by a Spasmodic

contraction of the internal oblique Muscles; if it is occasioned by the latter, it may be removed by those remedies which occasion great relaxation, as venesection, fomentations, or the warm bath; whereas, if a tendon be the source of the strangulation, such applications produce no good effect, tendons being incapable of relaxation or contraction.

10th, That the tendinous columns of the external oblique Muscle, do not always separate from each other, so as to form the UNDER ABDOMINAL APERTURE at the same place; hence the Tumour in an Inguinal Herniæ, has not always precisely the same situation; and if the smaller tendinous fibres which unite the larger tendinous columns be awanting, though the Hernial Tumour be truly a protrusion through the Inguinal Canal, it may have the same situation as a Crural Hernia.

11th, That when the bowels are protruded through the Inguinal Canal, and pass along the Spermatic Cord, these are directed obliquely downwards and inwards, in which situation, they are covered by the Cremaster Muscle, and the membrane derived from the tendon of the external oblique Muscle, which has been called the superficial Fascia.

12th, That as the Inguinal Apertures are extended in consequence of the bowels passing repeatedly through these, the UPPER INGUINAL APERTURE may be so much enlarged, as to be brought immediately opposite to the UNDER ABDOMINAL APERTURE; and in such a case, no part of the Hernial Tumour

has an oblique direction, for it passes directly through the Parietes of the Abdomen.

13th, That as there is fat around the UNDER ABDOMINAL, and also at the CRURAL APERTURES, if there be an unusual quantity of it in such a situation, it may bear a strong resemblance to a Hernia; and should colic, constipation and vomiting, follow, the case may be supposed to be a strangulated Hernia.

14th, That on account of the connection of the Crural Arch with the neighbouring Fasciæ, when we wish to relax as far as possible the superficial Fascia, and the Inguinal Canal, to take off the pressure and stricture upon the displaced Intestine, it is necessary to raise the head and Pelvis of the patient (who is supposed to be in bed) with pillows, to bend the thighs very considerably, and to throw the knee of the affected side over to the opposite side, leaving only sufficient space for the Surgeon to introduce his hand; that on attempting to reduce such Herniæ, the pressure should be made in the same direction as the Hernial Tumour, that is, in a recent Inguinal Hernia, the pressure should be made in the direction of the Anterior Spinous process of the Os Ilium; and in a Hernia of some duration directly upwards, as the UPPER and UNDER PARTS of the INGUINAL CANAL are, in such a case, nearly opposite to each other.

15th, That unless the truss shall make pressure not only upon the Under, but also upon the Upper

Abdominal Aperture, the Inguinal Hernia will not be removed, and that a truss which presses only upon the UNDER APERTURE, instead of affording relief, exposes the patient to strangulation at the UPPER ABDOMINAL APERTURE, or between the UPPER and UNDER ABDOMINAL APERTURES *.

16th, That from the situation of the Epigastric Artery in respect to the UPPER ABDOMINAL APERTURE, that vessel, when the bowels follow the course of the Inguinal Canal, is situated betwixt the Symphysis Pubis and the Hernia; whereas, when the bowels pass only through the UNDER ABDOMINAL APERTURE, as in the case of Ventro-Inguinal Herniæ, then the Epigastric Artery is situated nearer

* In justice to my Father, I cannot forbear from describing a Truss for an Inguinal Hernia, which he directed to be made twelve years ago, and which several of his patients have worn with much benefit.

The cushion of the common Truss is so small, as to cover one of the APERTURES only, and from its thinness, when the circular is tightened with the view of increasing the pressure on the APERTURE, the pad is raised forwards from the APERTURE, because the Ossa Ilia, and Ossa Pubis, are more elevated than it, in consequence of which the truss does not produce the desired effect.

He therefore directed, that the pad of the Truss should be be made much thicker and larger, and to be placed with such a degree of obliquity with respect to the circular, as to press upon both Apertures at the same time.

to the anterior Spinous process of the Ilium than the Hernia.

17th, As the Epigastric Artery is situated on the Pubal side of the Herniary Tumour, where the bowels pass through the UPPER, and then through the UNDER ABBOMINAL APERTURE, but upon the opposite or Ilial side, where the bowels pass only through the UNDER ABDOMINAL APERTURE; and as it is extremely difficult during life to distinguish these very different Herniæ, a prudent Surgeon will follow the advice of Mr ROUGEMONT, in operating. "Je crois d'après cela qu'il est permis de conclure qu'on coure moins de risque de leser l'artere épigastrique en et incisant en haut et en dehors, qu'en incisant en haut et en dedans; que pour reconnoitre exactement la disposition de cette artére il faut s'assurer de la position du cordon spermatique rélativement au sac, et supposé que cela soit impossible, il faut inciser au milieu du bord supérieur de l'anneau directement en enhaut."

18th, That on account of the connection of the Ilial and Transverse Fasciæ with the Crural Arch, the bowels can be protruded only through the Foramen Crurale, and that from the greater size of the female CRURAL APERTURE, greater width of the female Pelvis, a smaller size of GIMBERNAT's Ligament, and of the Iliacus Internus and Psoas Muscles, women are more exposed to Crural Herniæ than males.

19th, From the small size of the CRURAL APER-

TURE, and unyielding nature of the parts around it, strangulation is more common in this kind of Hernia than in the Inguinal, especially in the male.

20th, That the bowels in Crural Herniæ are frequently protruded in a direction perpendicular to the Abdomen, and on the fore-part of the Pectineus Muscle; and on account of the small size of the CRURAL APERTURE, and unyielding nature of the parts in the vicinity of it, the neck of the Tumour is but of a small size, and nearly of an uniform diameter, and from half an inch to three quarters of an inch long, as in Plate XIII. fig. 2. On account of the quantity of Cellular substance at the bend of the thigh, which yields readily; on account also, of the falciform process of the Fascia Lata, the Tumour, in a case of the Crural Hernia, does not descend, but is reflected, or, as I in my observations on Crural Herniæ observed, tilted upwards upon the Crural Arch, as in Plate XVIII., so that the fundus of it is the most prominent part, and the body and neck of the Sac form a considerable angle with each other; and the Tumour, sometimes, as in Plate XVIII., expands laterally to a considerable extent.

21st, Owing to the superficial Fascia, the quantity of fat, Cellular substance, and Lymphatic Glands which cover a Crural Hernia, it is very difficult to detect that disorder, which may very readily be mistaken for a swelling of the Lymphatic Glands. As a Crural Hernia may exist at the same time as a swelling of these Glands; hence the Surgeon must

judge of the nature of the disease, by the history of the symptoms, as much as by the knowledge he gains by examining the Tumour by his fingers.

22d, As the Inguinal Lymphatic Glands lie over the CRURAL APERTURE, Œdema of the limb of the affected side may be produced, by wearing a truss for the cure of Crural Hernia.

23d, That the coverings of a Crural Hernia vary according to the situation of the Tumour.

24th, From the connection of the Fascia Lata with the tendon of the external oblique Muscle, it is obvious, that if the thigh be extended, the Crural Arch must be put upon the stretch; and on the other hand, when the thigh is rotated inwards, and raised nearly to a right angle with the body, the Crural Arch is relaxed; hence the pain, which the extending the thigh creates in some cases of Crural Hernia.

25th, That no danger attends the division of GIMBERNAT'S Ligament, when the Obturator and Epigastric Arteries follow their usual route.

26th, That as the Obturator Artery, when it arises in common with the Epigastric, has as frequently a short as a long trunk, and as the Obturator Artery, when it has a short trunk, is in no danger of being divided when GIMBERNAT'S Ligament is cut through in performing the operation for Crural Hernia, as it runs upon the opposite or Ilial side of the Crural Hernia; hence that that circumstance is not so

great an objection to GIMBERNAT'S operation, as has been supposed *.

27th, That in many cases of Crural Hernia, the stricture is so complete, that the Surgeon finds great difficulty in introducing even the nail of his finger as a director, and is under the necessity of making the division of a few of the tendinous fibres (for it is surprising how little removes the stricture), in the direction in which there is sufficient room. Upon dividing the tendinous fibres, a little crack is heard, and the stricture is taken off.

28th, That as in our erect posture, the bowels gravitate directly against the CRURAL APERTURE, there is less chance of removing a Crural than an Inguinal Hernia, by the use of a well-made truss.

29th, That the Umbilical Ring may be slit up in any part, without the risk of wounding any blood-vessel of importance.

30th, That in Ventral Herniæ, there must be a separation or rupture of some of the muscular fibres of the Parietes of the Abdomen.

Such is the account of the parts concerned in Hernia, and such the inferences from it, which I have for several years past delivered in my courses of Lectures. But notwithstanding all that has been lately written upon the Anatomy of the parts con-

* Mr COOPER states, "that he never had met with the Obturator Artery passing around the neck of a Herniał Sac."

cerned in the Inguinal and Crural Herniæ, there is a branch of the subject which has not yet been explained to the Medical World—I mean the gradual formation of the Inguinal Canal.

Having found that Mr Allan Burns, of Glasgow, had devoted a great share of attention to this branch of the subject, I requested of him to favour me with his observations; with which request he readily complied, and, by his permission, I have inserted these in his own words.

"When we remove carefully all the Cellular Membrane from over the external oblique Muscle, we still find the muscular fibres covered by an aponeurotic expansion, which, toward the lower part of the belly, branches off into two processes. One plate we trace descending along the thigh, investing the Glands, and forming the subcutaneous Fascia, the other turns inwards, and incorporates itself with the fatty ligamentous substance found above the Pubes, and adhering in males to the Ligamentum Suspensorium Penis; and in females, to the Ligament of the Clitoris. Camper, the celebrated Dutch Anatomist, adds, "et involucrum dat musculo cremasteri." Mr Astley Cooper also describes most accurately the Fascia, which he represents as originating from the aponeurosis of the oblique Muscle, and investing the Tunica Vaginalis, forming for it a sheath. This Fascia is naturally not very strong, but in Hernia, it is sometimes immensely thickened. In one specimen of this disease in my possession, it is fully a quarter of an inch thick.

" When we divide longitudinally the sheath of the Cremaster or CAMPER's Fascia, we bring into view the Tunica Vaginalis, covering the Spermatic Cord; and if we trace the latter up toward the Abdomen, we lose it where it enters the lower orifice of the Inguinal Canal.

" In the fœtus, or new born male, we find that the tendon of the external oblique Muscle, at its inferior and anterior part, separates into two pillars, which leave between them an irregular opening, through which the cord passes. One of these pillars runs below the cord, the other above it. Both pillars tend obliquely downward and forward, inclining toward the crest of the Pubis, where one is completely lost, the other in part implanted. That fold which passes below the cord is completely implanted into the tough ligament which covers the tubercle of the Pubes. The other pillar, when it reaches the Pubes, separates into two bands; the posterior, or deeper-seated, is inserted along with the lower pillar into the tubercle of the Pubes, and even extends to the opposite side. The other, and by far the most important fillet, winds obliquely inward, then bending backward between the Penis and the cord, it at last incorporates itself with the Fascia, covering the heads of the Triceps Longus, the Gracilis and Flexor Muscles of the leg, and in some cases, it can be traced much farther, and reaches even to the tendon of the Glutæus Maxi-

mus, to which it is attached. This slip from the upper pillar of the Canal, is always inseparably joined to the Fasciæ covering the Cremaster; indeed, it may perhaps most properly be described as a part of CAMPER's Fascia, attached to the Ring. I thought that this structure had not been noticed by any author. I find, however, that it has not escaped that indefatigable Anatomist CAMPER, who delineates it very accurately in his plate. It is easiest detected by slitting up CAMPER's Fascia, by which I mean the sheath of the Cremaster, till we come near to the Ring. When we have done this, if we then insinuate the point of the finger into the lower orifice of the Canal in the adult, or Ring in the child, we find that we are by this fillet prevented from carrying the finger toward the Pubes.

"This part of the Canal merits peculiar attention; for whoever is ignorant of the position and connection of this production from the upper pillar of the Ring, can possess only a very confused notion of its action in disease.

"When I shall have stated the Anatomy of the Groin in the young subject, and have pointed out the changes which take place on these as life advances, I shall then have occasion to notice the effect of this fillet in preventing the formation of Hernia; and also, we shall see that when a protrusion has actually taken place, it has a considerable share in preventing reduction.

"When we have examined in the very young subject, the structure of the external orifice, through which the cord passes, we have seen all that is most worthy of notice, for in the very early part of life, the Inguinal Canal is not formed. In proof of which, take a new-born male, in whom the Tunica Vaginalis communicates with the cavity of the Abdomen, and make a puncture into the former, through which one of the blades of a pair of scissars is to be introduced, and passed into the Belly, then all that portion of the Tunica Vaginalis, which is above the puncture, is to be snipped through. By doing this, we lay the Abdomen and Tunica Vaginalis into one, and we at the first glance perceive whether the cord, at this early period of life, passes in an oblique direction between the muscles and Transversalis Fascia.

"I have never observed the cord in any obvious degree *oblique* in its course, in an infant at birth, it runs *in a straight line* from the Psoas Muscle to the bottom of the Scrotum.

"It passes through *a mere Aperture.*

"When, however, we take a subject even a month old, and treat it in the same way, we find then a *a very apparent obliquity* in the course of the cord. As, however, it is very rare to meet with an infant of that age, in whom the Tunica Vaginalis remains pervious, we may, where its canal is obliterated, by slitting up CAMPER'S Fascia, and entering the blade of a sharp-pointed pair of scissars into the lower

outlet of the Canal, pass it up till it appears in contact with that part of the peritoneum which invests the cord at that spot where it passes from the Abdomen. If we divide completely what is between the blades, we expose fairly the *degree of obliquity of the Cord.*

" If we examine, in a similar way, subjects of different ages, we find that the older they become, till they arrive near the age of puberty, *so much the longer does the Inguinal Canal become.*

" It may here be worth while to inquire how the Canal comes to be formed, and what changes take place on the neighbouring parts. As I have already mentioned, the upper and lower openings of the Fœtal Ring are *opposite to each other,* and so very little distant the one from the other, that there is hardly a palpable space between them. The Ring is placed just in contact with the tubercle of the Pubis. From this fact, it must at first sight appear, that the lower outlet is in the Fœtus, in the same spot which it is afterwards to occupy in the adult. In proportion, therefore, as the Fœtal Ring is changed into the Adult Canal, it is the *internal orifice* which changes its position ; it is the upper opening which mounts toward the Spine of the Ilium. We may from this very readily understand, that it is *from the gradual extension of the Transversalis Fascia,* in that direction, that the Cord comes to be inclosed in a Canal. A very simple contrivance gives a very clear idea of the manner in

which the Inguinal Canal is formed. Let any one take two slips of paper of the same length, and cut two small holes in the centre of each; let him then lay these holes opposite to each other, and pass through them a quill or pencil-case. When he has done this, he has a very good plan of the state of parts about the Groin in the Fœtus. If he now hold the papers opposite him, and then pull to a side the one nearest to himself, he will find, that by doing this, he comes to lay the quill between the pieces of paper in the same way that the Spermatic Cord, by the extension upward and outward of the Internal Orifice of the Ring, comes to be lodged in a long Canal. And he will also see, that the length of the Canal must vary according *to the greater or less extension of its posterior side.* Many have also been puzzled to comprehend how the Epigastric Artery can bear precisely the same relation to the Cord in the Fœtus and Adult, seeing the difference which has taken place in the relative position of the Internal Orifice of the Canal. This difficulty only occurs to those who do not properly understand the mechanism of parts. One who has made himself acquainted with the real structure, is never difficulted in following the changes. If the state of parts in the very young subject be known, and if the surgeon have examined those at an advanced period of life, by comparing the one with the other, he has at once unfolded to him the mode in which the Fœtal Ring is changed into the Adult Canal. He

is taught that it is a natural consequence *of the oblique extension of the Transversalis Fascia* toward the Spine of the Ilium. He sees, that in proportion to the degree in which the posterior side of the Canal overlaps the anterior, so must the length of the Canal vary. If he take a just and comprehensive view of these parts, he will be able to see in the structure, a wise provision of Nature to prevent protrusion at the Groin, and he will also be led to deduce some pathological inferences from the data before him. He will be prepared to understand why Inguinal Hernia is much more frequent in young than in old subjects; why it is often cured in the former, and seldom in the latter; and why in the one it is a more dangerous affection than in the other.

"In the very early period of life, the Cord, as we have just seen, passes through a *mere aperture*; and besides, there is an open communication between the Tunica Vaginalis and the Belly. From these circumstances, therefore, a portion of Gut is forced down along the Cord forming Congenital Hernia, or if the Tunica Vaginalis be obliterated, a new peritonical Sac passes through the Ring by the side of the Cord. As, however, the parts are more dilatable in the young than in the old person, so is Hernia, *cæteris paribus*, more readily reducible in the former, and consequently less dangerous. The Gut, in the first instance, in the young subject, passes through a *simple Ring*, but

if the Hernia be allowed to remain, then in many cases the upper Orifice, ascending toward the Spine of the Ilium, as it ought to do, comes in the end to lodge both the Hernial Sac and the Spermatic Cord, in a complete Canal; and this will probably be found to be the reason why surgeons believe that Hernia does often take place along the Canal. They see a Herniary Tumour in advanced age, lying in the oblique course of the Canal; but they forget to inquire when the protrusion took place, and what was the original appearance of the Tumour.

" Were they to trace their cases to their origin, they would most probably ascertain, that, in the first instance, the Hernia had appeared in infancy, that it had been *less oblique at the beginning, but imperceptibly became more and more so.* I speak from what I have seen in several instances. Among a considerable number of patients in whom the Hernia was lodged in the Canal, and of some of which I I have casts, I have uniformly, by applying to the friends, ascertained that the Rupture had taken place in infancy, and had slowly assumed the oblique direction. Some of the nurses have even said, that when immediately after birth, they attempted to return the Gut, they found that it had passed through a hole, about large enough to admit the tip of their little finger; but when the child was older, they found it run more to a side.

" In the advanced stage of Hernia, the parts are

brought into precisely the same state they were in when the disease began. In the Congenital Hernia, or in the common Inguinal Hernia taking place in a very young child, the Sac passes through *a mere aperture*, then, in time we have seen, that owing to changes which this opening undergoes, the Gut comes to be lodged in a *fully formed Canal*. This continues till the Tumour becomes large, when the posterior side of the Canal is, owing to the pressure, slowly absorbed; and again the upper and lower orifices are brought opposite to each other. Again, the Hernia resembles, in its appearance and course, the incipient Tumour.

"If the view which I have given of the mode of formation of the Inguinal Canal be correct, it will lead to this conclusion, that we ought, in every case of Hernia in a young child, most sedulously to prevent the descent of the Gut; and, if possible, to return also the Sac, where it is not Congenital Rupture; for if we do this, we bid fair to cure the disease, by allowing of the *extension of the posterior side of the Canal along the Cord*. This observation leads me to a review of the influence which the different parts of the Inguinal Canal have in preventing the accession of Hernia.

"In the very young child, there is no security against Hernia, except what arises from the Cord filling the Aperture through which it passes. This is generally sufficient, for the infant is exposed to few of the exciting causes of the disease.

" When, however, the child advances in years, in the course of its amusements, and afterward of its business, it is more and more exposed to the causes of Hernia.

" Nature has, however, wisely provided, that in proportion to the danger, the security should be increased. The posterior side of the Canal overlaps every day more and more the anterior side; consequently, when the canal is completed, any pressure against the posterior side, tending to produce Hernia, has *the effect of laying that side more firmly in contact with the Cord;* of forcing the latter steadily against the anterior side, where the fibres of the Transversalis and internal oblique Muscles react upon it. Thus a most perfect valve is formed, and where the posterior side of the Canal is fully extended, it is impossible that Inguinal Hernia can take place.

" I have already attempted to show, that where the Gut has passed down in infancy, it may in the end, come to be lodged in a Canal; but this is very different from a Hernia passing along the Canal for the first time in an adult. By the overlapping of one side of the Canal over the other, Hernia is prevented from primarily taking place in the adult, by the internal orifice of the Inguinal Canal.

" Although, for the reasons above stated, Hernia cannot often, if ever, take place by the upper orifice of the Inguinal Canal; still was there not some contrivance devised, it might happen by bursting

the posterior side of the Canal, opposite the lower orifice.

"The posterior side of the Inguinal Canal is formed, as was first demonstrated by Mr Cooper, by the Transversalis Fascia, which is thin and dilatable, and, therefore, independent of assistance, affords but a trifling barrier to protrusion. Nature has not, however, neglected this point, for, opposite to the inferior opening, she has strengthened the posterior side, by *a set of inflected fibres*, which arise, as described by Camper, from the folded-in lower pillar of the oblique Muscle, and run upward, expanding over that portion of the Transversalis Fascia, opposite to the lower outlet. This affords one security; but Nature seems peculiarly solicitous about defending this opening, and has therefore bound the two pillars firmly together, by cross slips, and made to arise from the upper one, a Fasciculus of Fascia, which, by winding round the top of the thigh, must, in these motions which would endanger the parts, be made closely to embrace the cord, adapting thus, in a most accurate manner, the size of the lower outlet to the size of the cord.

"We thus see, that *by the posterior wall of the Canal, Inguinal Hernia is, in the adult, prevented from taking place through the upper orifice;* and that by the peculiarity of the mechanism of the lower opening, *Ventro-Inguinal Hernia* cannot occur, except where by violence the posterior side of the Canal is burst, or the cross slips torn, by which the

fillet, from the upper pillar, would come to lose its effect.

" When Hernia has taken place, the very objects which formerly had a tendency to prevent its accession, are now so far changed in their action, that they present obstacles to the replacement of the Gut. If the Hernia has occurred in a young subject, where the Canal is not formed, or in an adult in whom the posterior side is wanting, which is not a very rare malformation, then our only difficulty must depend on the action of the lower outlet. In this case the cross fibres which bind the two pillars together, act on the Sac, and the fillet, from the upper pillar, embraces it closely but not equally, in every direction of the limb. When the toes are rolled inward, and the thigh, on the affected side, pulled from the other, and turned backward, this fillet is sunk into the Sac, and retains it immoveably in its situation.

" This species of stricture may most readily be overcome, by moving the member in an opposite way; and, I believe, in knowing how to humour the parts in the Taxis, the great superiority of one surgeon over another consists. When, however, the rupture has taken place in infancy, and continued till the complete extension of the Canal is accomplished, then, besides this source of difficulty, there is also a source of embarrassment, arising from the reaction of the fibres of the Transversalis and internal oblique Muscles upon the Sac,

which occasion a species of stricture in which blood-letting, warmth, and the relaxing the muscles by bending the body sideways, facilitate the reduction. The above remark applies to that species of incarceration dependant on a narrowing of the internal orifice of the Canal."

Of Inguinal Herniæ.

In this species of Hernia, the bowels are engaged in some part of the Inguinal Canal.

Man, from his erect posture, is more exposed to Inguinal and Crural Herniæ, and quadrupeds to Ventral Herniæ.

Owing to the larger size of the Inguinal Canal in the male, men are much more frequently afflicted by Inguinal Herniæ than women. What I have affirmed respecting the greater frequency of Inguinal Herniæ, has been illustrated by observations made upon a large scale, which are recorded in the 25th Volume of the Philosophical Magazine. It is there stated, page 88, " As many persons do not know that females are liable to this heavy affliction, the following statement, founded on actual experience, will show the proportion of Herniary complaints in each sex, out of more than three thousand cases.

		Males.	Females.
741 Double Ruptures.	In both thighs (femoral)	3 &	44
	In both groins (inguinal)	609 &	85
2272 Single Ruptures.	In one thigh (femoral)	57 &	163
	In one groin (inguinal)	1520 &	399
	In the navel (umbilical)	36 &	97
	Total	2225 &	788—3013

"Of the single ruptures, more than one third happened on the left side, and nearly two thirds on the right side. A very small proportion of triple ruptures, and other extraordinary cases, likewise occurred in the above number; but they were extremely rare, and mostly existed among the female sex."

Dr Forbes's testimony is equally strong. This gentleman was Surgeon to the Royals, and Inspector of Recruits to the four battalions of that regiment. He informed me, that in the course of his attendance on soldiers, he had seen several hundred cases of Inguinal or Scrotal Hernia, but does not recollect to have met with a single example of the Crural Hernia.

As the greater size of the Inguinal Canal predisposes to the Inguinal Hernia, hence, when that Canal is extended beyond its natural diameter, unless there exists a cause which opposes the protrusion of the contents of the Abdomen, some part of the bowels passes into the Inguinal Canal.

Thus the Varix of the Veins of the Spermatic Cord, or a Hydrocele of long standing, the upper part of which has insinuated itself within the Under Abdominal Aperture, have been the preludes of Inguinal

Herniæ. Upon drawing off the water, some part of the bowels passes into the enlarged Inguinal Canal, the obstacle to their protrusion having been removed.

There is much variety as to the size, and as to the form of an Inguinal Hernia, of which there are *four different modifications*.

The first is the most frequent, viz. where the displaced bowels have passed through the whole track of the Inguinal Canal, and form an external Tumour at the UNDER ABDOMINAL APERTURE, which, frequently extending downwards, creates in the Scrotum a Tumour of considerable magnitude, called a Scrotal Hernia.

In the second modification of Inguinal Hernia, the Tumour is *not external* to the Parietes of the Abdomen, and the Tumour is confined either to the UPPER ABDOMINAL APERTURE, or to that part of the Inguinal Canal which intervenes between the UPPER and UNDER ABDOMINAL APERTURES.

The third modification of Inguinal Hernia is widely different from either of the preceding; the Tumour, which is external, appears in the seat of the UNDER ABDOMINAL APERTURE, but is not placed obliquely; for the displaced bowels have not followed the track of the Inguinal Canal, but have passed through the UNDER ABDOMINAL APERTURE only: hence this has very properly been named the *Ventro-Inguinal Hernia*.

The fourth modification of Inguinal Hernia is produced by *malconformation of the Inguinal Canal;*

for owing to the want of the small tendinous fibres which connect the upper and under tendinous columns of the tendon of the external oblique Muscle, the Inguinal Canal is imperfectly formed, and consequently, when the bowels pass through such an Inguinal Canal, the Hernial Tumour has neither the common form, nor does it occupy the common situation of an Inguinal Hernia.

Of the Common Inguinal Hernia.

Where the displaced bowels have followed the track of the Inguinal Canal, there is much variety as to the size of the Hernial Tumour, the upper part of which is oblique, and there is the same distance, and the same relative position between the Upper and Under Abdominal Apertures, as before the displacement of the bowels.

This Hernia is reducible, irreducible, or sometimes strangulated.

When the protruded bowels are not properly supported, these soon pass into the Scrotum, which consisting of loose skin, and a quantity of cellular substance, does not oppose the expansion of the Tumour, which sometimes acquires an enormous bulk, and contains the greater share of the more moveable bowels of the Abdomen, as in the following case.

A man of 60 years of age, who laboured under a Hernia on each side, consulted my Father. That of the right side reached four inches below the knee,

and was not less than two and a half feet in circumference. From the Under Abdominal Aperture, for the space of eight inches, the Tumour felt hard, and the under part of the Tumour contained a watery fluid.

The Hernia of the left side contained Intestine, which was much stretched with air, and was about nine inches long, and six in diameter.

Such very large Herniæ, I have been informed, are very frequent at Lisbon, Malta, and also in Egypt.

These Herniæ, besides their mere bulk and weight, prove the source of much inconvenience and uneasiness; the Penis is sunk within the Tumour, and the Urethra being distorted, the urine is discharged with difficulty, and is apt, by distilling along the skin, to fret and inflame it to a great degree.

The displaced bowels have sometimes been ruptured in consequence of external violence*, or a Sinus forms in the Scrotum in consequence of the Hernia, which it is impossible to heal without confining the patient to bed.

In proportion as the Hernial Tumour becomes larger, it contracts adhesions with the neighbouring parts.

The functions of the displaced bowels are much impaired, not only from their being without the ca-

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* Vid. Cooper, page 17.

vity of the Abdomen, and hence not exposed to the pressure of the Abdominal Muscles, but from their being twisted, and compacted together by unnatural adhesions, and displaced. In the case of the late celebrated Mr Gibbon, the Pylorus was drawn down to the Pubes*.

There has been in some constitutions, so great a relaxation, that even those bowels which are fixed down firmly at a distance from the groin by the Peritoneum, have gotten into the Hernial Sac, as the Stomach, Liver, and Spleen.

The Uterus has sometimes been protruded at the groin; cases of that description are mentioned by Hildanus, Ruysch, and Lallement.

Dissection of the Hernial Tumour.

The coverings of the Tumour are, Skin, Cellular Membrane, by some called a Fascia, which is of various thickness, and the Cremaster Muscle.

Upon extending the incision to the Under Abdominal Aperture, the tendinous fibres which connect the larger tendinous columns of the external oblique Muscle, generally are found to be of an unnatural thickness, and consisting of distinct layers, which adds much to the thickness of the Sac.

The Under Abdominal Aperture is not only larger, but also of an unusual form.

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* Vid. Astley Cooper on Hernia, Part I. p. 18.

The small branches of the external pudic Artery are found between the Skin and Hernial Sac, and these, as CAMPER has justly represented in his figures, attain, in Hernia of some duration, an extraordinary size.

The Epigastric Artery is situated in the first place behind, and then between the Hernial Sac and Ossa Pubis, and is pushed nearer to the Pubes, when the Hernial Tumour attains a large size.

The Spermatic Cord is commonly placed behind the Hernial Tumour. But sometimes the Hernial Sac splits the Cord; Plate XVII. exhibits a case, which occurred to my Father more than forty years ago, in which the Hernial Sac disunited the different parts of the Spermatic Cord. The Vas Deferens was found upon the fore-part of the Tumour, the Spermatic Artery and Vein behind it. In a case described by CAMPER, the Spermatic Artery and Vein were found before, and the Vas Deferens behind the Tumour.

There is still another variety in the situation of the Spermatic Cord, which has been described by LE DRAN and SCHMUCKER, that is, the Cord is placed in front of the Sac.

The stricture, according to Mr COOPER, in recent and small Herniæ, is most frequent at the UPPER APERTURE, and occasioned by the internal oblique and Transverse Muscles; but in Herniæ of large size, and of some duration, at the UNDER APERTURE. The strangulation may be seated between the UP-

PER and UNDER APERTURES, or at both APERTURES, and sometimes, though rarely, it is occasioned by a thickening at the mouth of the Hernial Sac*.

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* My Grandfather observes, (Vid. quarto edition of his works, p. 562), "After the bowels are reduced in appearance, the Surgeon ought to search with his finger, lest there be any contracted ringlet, cross bars, or production of the Peritoneum above the Ring of the Muscle, which might continue the strangulation.

"Such strangulating Rings are most frequently to be met with in people who have long worn Trusses, which have pressed the sides of the Sac together."

Mr ARNAUD observes, in page 357 of his Dissertation on Herniæ, "Upon examination, I found that the Tumour was not in the least diminished, either in length or diameter; for what seemed wanting outwardly, formed an internal Tumour under the Muscles, reaching from the Ring to within two fingers-breadth of the anterior and superior process of the Ilium." And in page 366, he adds, "I dilated the Ring in my usual manner, but could not reduce the gut. I introduced my finger in order to discover the obstacle that opposed the reduction, and at the depth of two inches beyond the Ring, I felt with the point of my finger, a very close and firm membraneous circle, which made even a tighter stricture upon the parts than the Ring itself had done."

There are in some cases several causes of strangulation, and in page 392, he observes, "I introduced (says he), my finger quite to the orifice of the Sac, which lay about three inches deep, under the Muscles, towards the Superior and Anterior process of the Os Ilium; I dilated the stricture of the Sac, with my probe-pointed bistoury, conducted by my finger; the patient went to stool about an hour thereafter, and all the bad symptoms disappeared."

BERTRANDI, asserts, "that the transverse and internal Muscles sometimes produce strangulation, and constituting a Tumour of an inch or two in length."

The varied seat of the stricture points out the necessity of the most minute examination into every circumstance of the case.

As the UNDER ABDOMINAL APERTURE is composed of tendinous fibres, little can be expected from those remedies which induce relaxation, tendinous fibres being incapable of relaxation; but an internal stricture produced by the transverse or internal oblique Muscles, may be removed by such means.

In consequence of the duration of an Inguinal Hernia, it to a certain degree changes its place, in consequence of the extension of the UPPER ABDOMINAL APERTURE. The upper part of the Tumour which had an oblique direction in respect to the body of it, becomes perpendicular in respect to the body, the UPPER and UNDER ABDOMINAL APERTURES being nearly opposite to each other; hence the necessity of accommodating the form of the pad of the Truss to the stage of the disease.

It is unnecessary to describe the common Inguinal Hernia of the female, as the round ligament of the Uterus bears to the Hernial Tumour the same relative situation as the Spermatic Cord of the male.

Of Internal Inguinal Hernia.

The second modification of Inguinal Hernia is internal to the Parietes of the Abdomen, for the bowels occupy only the space between the UPPER and UN-

DER ABDOMINAL APERTURES, or are engaged in the UPPER ABDOMINAL APERTURE.

I have seen an external converted into the internal Inguinal Hernia, by wearing an ill-made truss, which, by pressing upon the UNDER ABDOMINAL APERTURE, had induced the accretion of the opposite sides of the Sac; but that part of the Inguinal Canal, between the UNDER and UPPER ABDOMINAL APERTURES was not obliterated, and being filled by the protruded bowels, the patient, instead of being relieved, incurs even greater risk of strangulation, than when the bowels had passed through the UNDER ABDOMINAL APERTURE.

In this case, the Tumour lies upon the Spermatic Cord, is covered by the Cremaster Muscle, and the tendinous Aponeurosis of the external oblique Muscles, and the transverse and internal oblique Muscles pass over the neck of the Tumour, and prove the cause of the strangulation, and the Epigastric Artery is situated in respect to the Hernia, as in the more common Inguinal Hernia.

We have been chiefly indebted to MURRAY*, to Mr CLINE, and Mr COOPER, for a description of this kind of Hernia. It has been stated, that when the Hernial Tumour is not external, it is of a small size, but I met with a case in which the internal Tumour at the UPPER ABDOMINAL APERTURE, was as

* Vid. his Animadversiones in Hernias Incompletas.

large as an orange. The contents of the Tumour could not be drawn into the Abdomen, until the UPPER ABDOMINAL APERTURE was slit up, on account of the enlargement of the included Omentum, which adhered firmly to the protruded Intestines.

Of Ventro-Inguinal Herniæ.

In the third modification of Inguinal Hernia, the bowels do not follow the course of the Inguinal Canal, but are protruded through the UNDER ABDOMINAL APERTURE only; hence this species has been called the Ventro-Inguinal Hernia.

Mr COOPER has imputed this kind of Hernia to the non-existence, weakness, or rupture of the tendon of the Transversalis Muscle.

Mr LAWRENCE has lately described a Ventro-Inguinal Hernia, where the Fascia Transversalis was protruded before the Peritoneum, and formed a thick Aponeurotic covering to the Hernial Sac*.

The Epigastric Artery is placed at its usual distance from the UNDER ABDOMINAL APERTURE, and, along with the Spermatic Cord and Cremaster Muscle, is situated on the Ilial side of the Tumour, unless where the Tumour has been occasioned by external violence.

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* Vid. page 185 of his Treatise on Ruptures, 2d edition.

In this case, no part of the Tumour is oblique; it passes directly upwards, behind the UNDER ABDOMINAL APERTURE, and the internal oblique and transverse Muscles of the Abdomen pass across the neck of it.

Of Inguinal Herniæ, which, in situation, resemble Crural Herniæ, owing to Malconformation of the Inguinal Canal.

The fourth modification of Inguinal Hernia is occasioned by the malconformation of the Inguinal Canal, which is owing to the smaller tendinous fibres, which connect the larger columns of the external oblique Muscle, being wanting.

In these circumstances, the Inguinal Canal is imperfect; hence the bowels, when protruded, do not follow the course of the Inguinal Canal, but push immediately downwards and outwards, forming a Tumour like a Crural Hernia.

This modification of Hernia has been described by the late Professor HAMILTON, of Glasgow, and also by PETIT. It remained for Mr ALLAN BURNS, of Glasgow, to detect the cause of such a deviation, which he has described to me in the following letter, dated March 7, 1806.

"The case to which you allude, is a non-descript Hernia. The Tumour was found in the bend of the left Thigh of an old emaciated female.

"On dissection, I found the Inguinal Canal ful-

ly as large as it is usually met with in the male, and besides, so very short, that it presented, when fully unfolded, almost the appearance of a mere Aperture. The round ligament of the Womb was enveloped in a distinct Tunica Vaginalis, and bearing the same relation to the Intestine that the Spermatic Cord does in the other sex. On the right side, the Herniary Sac was about two inches in length, and in shape resembled a Florence flask; the bulbous extremity, extending from the lower orifice of the Canal, was contained in the upper part of the Thigh, *lying more in the course of a Crural than of Inguinal Hernia.*

" By dissection, we ascertained, that the deviation from the usual direction of the Tumour was produced by a premature separation from each other, of the external pillars of the Inguinal Canal. Where the Inguinal Canal is imperfectly formed, it is generally owing to the incomplete extension of the posterior or internal side of the Ring.

" Where this happens, the internal orifice of the Canal is brought nearer to the Pubes than it ought to be, but when the imperfection is produced by a premature separation at the external pillars, then, by dissection, we find the internal orifice in its proper place, but the external outlet is removed from the Pubes.

" In the first instance, when the Herniary Tumour protrudes, it lies just over the tubercles of the Pubes, and follows the course of the Spermatic Cord into

the Scrotum, while in the latter, it lies nearer to the spine of the Ilium, and is seated just over the Crural Foramen, and by extension, descends along the Thigh, *counterfeiting the appearance of Femoral Hernia.*

"By attention, however, it is readily distinguished from the latter, by being felt lying over the Crural Arch, and on the outer side of the tubercle of the Pubes.

"When the bowels follow the course of the Inguinal Canal, the Epigastric Artery is situated nearer to the Symphysis Pubis than the Hernia; whereas, when the Bowels do not follow such a course, but pass only through the Under Abdominal Aperture, then the Epigastric Artery is situated nearer to the Anterior Spinous process of the Ilium than the Hernia."

We sometimes meet with two, three, or even a greater number of Inguinal Herniæ, and all of these may be of the same kind *; or a patient has a common Inguinal Hernia on one side, and a Ventro-Inguinal Hernia on the other; or the same patient, as in Plate XI., is afflicted by Crural Herniæ, and also by Pudendal Hernia.

In these cases, it is extremely difficult to deter-

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* Mr Astley Cooper met with a case in which there were six Ventro-Inguinal Herniæ.

mine, when there are symptoms of strangulation, which is the cause of the symptoms *.

I have also seen the opposite sides of the neck of a Scrotal Hernia adhering to each other, in consequence of the use of a truss, while its body was filled by a watery fluid.

Symptoms of Inguinal Hernia.

A Tumour situated in the vicinity of the UNDER ABDOMINAL APERTURE, into which it insinuates itself, and possessing the characters enumerated in the general observations, is an Inguinal Hernia. The Tumour frequently descends in front of the Spermatic Cord, into the Scrotum, and is then called a Scrotal Hernia.

When the bowels have not penetrated through the UNDER ABDOMINAL APERTURE, the Tumour is generally small, less circumscribed, is covered by the Aponeurosis of the external oblique Muscle, and appears, as Mr A. COOPER has justly observed, "merely as a fulness above the Ring, and POUPART's Ligament."

If the Tumour is nearer the Pubes than common, and appears to have made its exit from the Abdomen, immediately behind the UNDER ABDOMINAL

* Vid. Mr ASTLEY COOPER's 1st Part, page 27.

Aperture, and if the Spermatic Cord can be perceived on the Ilial side of the Tumour, the case is a Ventro-Inguinal Hernia.

But when a Hernia is occasioned by external violence, the case may be a Ventro-Inguinal Hernia, though the Spermatic Cord and Epigastric Artery be situated on the Pubal side of the Tumour*.

There are several diseases which bear a strong resemblance to an Inguinal or Scrotal Hernia.

Fat in the Groin sometimes assumes the shape of an Inguinal or Crural Hernia, and being covered by a thin layer of condensed Cellular substance, communicates to the touch nearly the same sensations as an Omental Hernia.

If a patient, with masses of fat so situated, had been seized with Colic and Vomiting, and had been at the same time much constipated, recourse might have been had to an operation, for pressure does not alter the shape or bulk of such Tumours.

The history of the progress of the swelling unfolds the nature of it.

2d, The Testis stopping in the Groin, gives rise to a Tumour not unlike to an Inguinal Hernia, more especially as the Testis is not fixed in its place.

A swelling in the Groin originating from such a cause, may be discovered by the want of the Testis

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* Mr A. Burns, has met with several such cases.

in the Scrotum, and by the very peculiar sensation which pressure on the Testis creates.

The case becomes much more puzzling when a turn of the Intestine slips down behind the Testis, sticking at the Groin.

3d, A Polypus contained in a Cyst growing from the Spermatic Cord, bears a strong resemblance to an Inguinal Hernia.

In the Museum of Mr A. Burns, of Glasgow, there is a specimen of an Inguinal Hernia, in which a Polypus grew from the Spermatic Cord. Before the dissection, the Polypus seemed to form a part of the Hernial Sac, and was of a reddish-brown colour, and communicated to the touch the same sensation as a portion of thickened intestine, and might have occasioned considerable embarrassment during the operation, if the Hernial Sac, and Cyst containing the Polypus, had been laid open at the same time.

4th, The Inguinal has sometimes been mistaken for the Crural or Pudendal Hernia. The Diagnosis is founded upon the situation of the neck of the Tumour; if the neck be placed above the margin of the Crural Arch, the Tumour is an Inguinal Hernia, if under it, a Crural Hernia.

The Pudendal Hernia, which is seated in the middle of the Labium, may be distinguished from the Inguinal Hernia, by being placed on the inner side of the ramus of the Ischium, and may be traced as far as the Vagina extends, and besides, there is no

swelling in the course of the round Ligament of the Uterus from the Groin.

5th, A Steatom at, or in the neighbourhood of the Under Abdominal Aperture, may be mistaken for an Inguinal Hernia. I saw lately a man who has an Inguinal Hernia, and a Hydrocele on the left side, and there was a Steatom as large as the fist in the region of the right Under Abdominal Aperture. It merits mention, that this patient had also a Steatom under the left Axilla, and one a little above the Navel.

6th, An Inguinal Hernia bears a considerable resemblance to a Hydrocele, especially when it extends within the Inguinal Canal, as the Tumour has the same figure as a Hernia, and, like it, becomes larger by coughing, and communicates a sensible impulse to the hand. The fluctuation, and pellucidity of the Tumour, have been supposed to be characteristic of Hydrocele; but neither of these symptoms are perceptible in a Hydrocele of some duration, from the thickness of the Vaginal Coat, or from an admixture of coagulated blood with the effused fluid.

The history of the complaint throws more light upon the nature of the disease. The Hydrocele is an uniform swelling of a pyriform figure, which begins in the lower part of the Scrotum, and gradually extends upwards to the Under Abdominal Aperture, and the Spermatic Cord may be perceived of its natural size above, but with difficulty behind the

Tumour; there is no derangement of the functions of the Alimentary Canal, and the bulk of the Tumour, which has an uniform feeling when pressed, does not vary in different postures of the body; whereas a Hernia often disappears, by putting the patient in a certain posture, and the Tumour is often of an irregular figure.

7th, An Inguinal Hernia may be mistaken for an enlargement of the Veins of the Spermatic Cord.

This kind of Tumour, like a Hernia, increases in bulk on coughing, becomes much less when the patient lies on his back, and sometimes can be pressed into the Abdomen, and the swelling begins in the lowest part of the Scrotum, and ascends gradually.

The above diseases may be distinguished in the following manner. In both cases, the Tumour disappears whilst the patient is in bed; if pressure be made whilst the patient is in that situation, upon a Hernia, the Tumour does not re-appear when the patient gets up; whereas, if the enlarged Spermatic Veins cause the swelling, in consequence of the pressure impeding the return of the Venous blood, and not interrupting the flow of blood by the Spermatic Arteries, the Tumour attains a considerable bulk.

8th, The Scrotal Hernia may also be mistaken for an enlargement of the Testicle.

The weight, deep-seated pain, and sensation which the diseased Testicle communicates when pressed, point out the cause of the swelling; be-

sides the enlarged Testicle in many cases retains its natural form.

9th, As a Lymphatic Gland is sometimes lodged within the Inguinal Canal, if that shall attain an unnatural bulk, it may bear a considerable resemblance to an internal Inguinal Hernia.

10th, A Scrotal Hernia which sometimes originates from external violence, may be mistaken for the effusion of blood within the Vaginal Coat, or within the body of the Testis. But in the latter case, the Tumour does not become larger upon the patient coughing; the Spermatic Cord at the Under Abdominal Aperture is not involved in the swelling, and the skin over the Tumour has a red colour.

Upon the whole, the Inguinal Hernia may be distinguished from other swellings at the Groin, by attending to the origin and progress of the disease; by observing that the swelling is first perceived at the Groin, and the swelling may also be perceived to pass into the Inguinal Canal; these marks, combined with the other symptoms already enumerated, characterise the common Inguinal Hernia.

It is much more difficult to detect an internal Inguinal Hernia, on account of the small size of the Tumour, and the thickness of the tendinous Aponeurosis of the external oblique Muscle which covers it.

EXPLANATION OF PLATE XVII.

This Plate represents the Vas Deferens, separated from the rest of the Spermatic Cord by means of a Hernial Sac.

The case occurred to my Father while he was prosecuting his studies at Berlin, more than fifty years ago.

A, The Vas Deferens, situated before the Hernial Sac, B.

PLATE XVII.

Of Crural Herniæ.

In the records of Physic and Surgery, there is much inaccurate and contradictory information relative to this species of Hernia, the Anatomy of the Crural Arch, and parts connected with it, being till lately imperfectly understood.

Much is due to Mr GIMBERNAT of Spain, whose minute Anatomical researches have thrown much light on this intricate variety of Hernia.

It has been universally admitted, that women are more frequently afflicted by this kind of Hernia than men, and that the disease is very rare before puberty.

The causes of these remarkable circumstances have not been explained, which led me to institute a comparison between the male and female Pelvis, and also to examine, with the most scrupulous attention, the various changes which the Pelvis undergoes, as to its size and shape, at different periods of life.

In the female, the bowels in the neighbourhood of the CRURAL APERTURE, are not so fully supported as in the male, (compare fig. 1st, Plate XIII., with fig. 2d of Plate XV.); that part of the Crural Arch of the male, which is inserted into the Linea Ilio-Pectinea, is somewhat of the form of a crescent, and therefore, the space between it and the Anterior Iliac Vein is very trifling; whereas the same part of the Internal edge of the Crural Arch

is much narrower in the female, consequently the Crural Aperture is more capacious, to which the smaller size of the Iliacus Internus and Psoas Muscles also contributes.

The effect of the support of the internal part of the Crural Arch is rendered still more obvious by an observation of Arnaud, who states, that of twenty women afflicted by Crural Hernia, nineteen were married; the relaxation, therefore, induced by pregnancy, gives a predisposition to Crural Hernia.

The effect of the bones of the Pelvis in giving support to its contents, is also to be taken into account.

Before puberty, there is little difference in the capacity of the Pelvis of the male and female: Hence Crural Hernia is a very rare disease in early life; I have never seen an example of it; and Mr Astley Cooper, in his very extensive practice, reports, that he had met with but one case of the disease; but after puberty the female Pelvis expands laterally *.

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* The celebrated Baudelocque gives the following measurements of the Female adult Pelvis. "Pour déterminer plus exactement l'étendue de ce détroit, il est nécessaire d'y remarquer plusieurs diamètres. Le plus petit, dont la longueur est en général de quatre pouces, s'étend du milieu de la saillie du sacrum à la partie supérieure et interne de la symphyse du pubis: on peut le nommer sacro-pubien. Le plus grand passe d'un côté à l'autre du détroit, et a, pour l'ordinaire, un pouce de plus que le précédent. Les autres, au nombre de deux, s'étendent dia-

Before proceeding into detail respecting the varieties of Crural Hernia, it may not be improper to premise a few general observations.

A Crural Hernia is generally of a small size, rarely larger than a walnut; in a few instances, the swelling can scarcely be said to form an external Tumour.

A Crural Hernia has not only the irregular surface of an Inguinal Lymphatic Gland, but also communicates the same sensation when pressed; indeed the Hernial Tumour is, in many cases, in part covered by the Inguinal Glands. Vid. Plate XIII, fig. 4th.

The figure of the Hernial Tumour, when detached from the other parts, is very different from that of an Inguinal Hernia; it has a long narrow neck, of an uniform diameter, and then suddenly expands into a body, the breadth of which is generally greater than its length. Vid. Plate XIII, fig. 2d.

Crural Herniæ are generally filled by a portion of Intestine, and frequently by a process of Intestine which is somewhat like the finger of a glove, which has hence been called Diverticulum. Vid. Plate XIV. fig. 2d.

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gonalement du fond de l'une des cavités cotyloïdes, à la jonction sacro-iliaque opposée, en traversant obliquement le détroit, ce qui leur a fait donner le nom de diamètres obliques: ils ont ordinairement six lignes de plus que le sacro-pubien et six lignes de moins que le diamétre transversal. Ces deux derniers coupent le bassin à angles droits, et les diamètres obliques divisent ces angles en aigus." Vid. Quatrième Edit. P. 41.

The Spermatic Cord and round Ligament are rather more than half an inch distant from the mouth of the Sac of the Hernia, and on the upper and Ilial side of it. Vid. Plate XIV, fig. 1st.

Of the Varieties of Crural Hernia.

There are several varieties of this disease.

1st, *The most common kind* of Crural Hernia is that in which the bowels are protruded through the Crural Aperture into the Lymphatic Sheath, which is thereby much distended and protruded.

In this instance, the Hernial Tumour is situated on the Pubal side of the Femoral Vein, and is covered by the Fascia Propria*, which is rather thicker

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* The Fascia Propria has been thus described by its discoverer, Mr Astley Cooper. "A thin fascia naturally covers the opening, through which the hernia passes, and descends on the posterior part of the pubes. When the hernia therefore enters the sheath, it pushes this fascia before it, so that the sac may be perfectly drawn from its inner side, and the fascia which covers it left distinct. The fascia, which forms the crural sheath, and in which are placed the hole or holes for the absorbent vessels, is also protruded forwards, and is united with the other, so that the two become thus consolidated into one. If a large hernia is examined, this fascia is only found to proceed upwards, as far as the edge of the orifice on the inner side of the crural sheath, by which the hernia descends; but in a small hernia it passes into the abdomen as far as the peritoneum, and forms a pouch, from which the hernial sac may be withdrawn, leaving this, forming a complete bag over the hernia."

than the healthy Peritoneum, under which a small quantity of fat is found between it and the Hernial Sac.

The neck of the Hernial Tumour is covered by the upper insertion of the Falciform process of the Fascia Lata, and the Epigastric Artery is situated on the Ilial side of the Tumour: and about an inch from it.

In the second variety of Crural Hernia, the protrusion of the bowels takes place through an Aperture in the Membrane, which passes across the Crural Aperture; a Lymphatic Gland which had filled up that Aperture, having been displaced, and pushed to the Ilial side of the Crural Hernia.

The stricture in this instance is sometimes occasioned by the sides of the Aperture through which the protruded Intestine had passed. This variety is peculiar in wanting the Fascia Propria.

The third variety of Crural Hernia is that in which the protruded bowels pass into the sheath surrounding the Femoral Lymphatics, and then escape by one of the Apertures, through which the Lymphatic Vessels enter the sheath, as has been accurately described by Mr A. Cooper. The Tumour has not a well defined edge, being covered by the Fascia Lata of the Thigh.

In this Hernia, the strangulation may be occasioned by the border of the sheath.

The fourth is that variety of Crural Hernia where the Tumour passes through the Ilial side of the

Lymphatic sheath, into the sheath of the Femoral Vein. Vid. Plate XVII. fig. 1.

The Hernial Tumour is originally situated on the Pubal side of the Femoral Vein, having the semilunar fold of the Fascia Lata stretched across its neck, and the Epigastric Artery is situated on the Ilial side of the swelling, and its termination is placed in front of the Femoral Vein, distending the sheath of that vessel.

In the fifth variety of this disease, there are two Tumours; the one escapes into the sheath of the Vein, the other into that of the Lymphatic Vessels. Vid. Plate XVI. fig. 2.

Mr A. Burns discovered this variety, and from his preparation the figure above alluded to is taken.

In this instance, the Obturator Artery passed between the Herniæ, and encircled the Tumour next the Os Ilium.

Mr Burns, speaking of this variety of Crural Hernia, has remarked, " When this happens, in a person in whom the Obturator Artery comes off by the short origin from the Epigastric Artery, the former vessel will to a certainty encircle the Pubal side of the neck of the Ilial Sac. If, however, the Obturator Artery and the Epigastric continue connected for a considerable distance from their origin, and if one Herniary Tumour pass into the sheath of the Vein, and another escapes into the common sheath of the Lymphatics, then both Sacs will be transversed on their upper margins by the Obturator Artery, and

the Tumour in the Lymphatic sheath will likewise have the same vessel on its Pubal side. I have never seen this variety in the course of the Obturator Artery, but I dissected the body of an aged woman last summer, in which I found one Sac in the sheath of the Lymphatics, and another in the sheath of the Vein. In this subject, the Obturator and Epigastric Arteries came off by a short trunk from the external Iliac, and the Obturator in its way to the Thyroid Foramen, encircled the neck of the Sac contained in the Venous sheath. This new variety of arrangement of the Obturator Artery shows, that the general opinion respecting the safety of cutting toward the Pubis, in those cases where the conjoined trunk of the Epigastric and Obturator is short, is not well-founded. In this female we have seen, that although the common trunk of these vessels be very short, yet from the Ilial Tumour descending into the sheath of the Vein, the neck of that Sac is encircled by the Obturator Artery."

The *sixth* is a frequent variety of Crural Hernia; the displaced bowels, in the first place, descend in a direction perpendicular to the abdomen, and lie over the Pectineus muscle; the Tumour is therefore very moveable. In consequence of the connection of the Falciform Process of the Fascia with Poupart's Ligament, and the duration of the disease, the Tumour is frequently reflected over the Crural Arch, Vid. Plate XVIII., and is covered by the Superficial Fascia, Skin, and Cellular substance only.

From the great looseness of the Cellular substance at the sides of the Tumour, it extends laterally, so that the transverse is the longer diameter of the Tumour. This kind of Hernia sometimes attains a considerable bulk, as in the annexed Plate (which is only half the size of nature), or as in a case my Father met with, in which the Hernial tumour was in size equal to both his fists.

In this variety of Hernia, the Hernial Sac, as in Plate XVIII, is remarkably thin, &c. so that the vermiform contractions of the protruded portion of Intestines are visible, and the neck of the Tumour forms nearly a right angle with its body.

In the seventh variety of Crural Hernia, the protruded Bowels primarily enter the sheath of the Lymphatic Vessels, and then pass through holes for the transmission of vessels in the Falciform Process, and in the Superficial Fascia. The Tumour is in a great measure immoveable, and bears a very strong resemblance to enlarged Inguinal Glands, Vid. Plate XIII. fig. 3d. A central fluidity or elasticity in the Tumour, derived from the contents of the displaced portion of Intestine, is the chief circumstance which characterises this variety of Crural Hernia.

The *eighth* variety of Crural Hernia cannot be distinguished by an external examination. In this, the Obturator Artery arises from the same trunk as the Epigastric Artery. The common trunk being an inch long, the Obturator Artery, in its course to the

Obturator Aperture, sweeps around the neck of the Hernial Tumour on its *Pubal side.* I have met with three cases of this description.

On account of the small size of the Crural Ring, and unyielding nature of the surrounding parts, a considerable pressure is made on the protruded bowel, and it is more difficult to return the displaced parts than in Inguinal Herniæ. The pressure very often causes acute Inflammation; and hence the contents of the Tumour are frequently covered by coagulable lymph, which binds the contents of the Tumour to each other, or to the neck, or some other part of the Sac.

The effusion of coagulable lymph is not limited solely to the inner surface. I have seen so great a degree of inflammation excited, that it extended even to the outer surface of the Hernial Sac, which was covered by a crust of coagulable lymph, nearly one-fourth of an inch thick, which proved a bond of union between the Hernial Sac, adjacent Lymphatic Glands, Fat, and Cellular Membrane. In some cases, the cavity of the protruded Intestine, has been in part filled by coagulable lymph.

In Plate XIV. and fig. 2d, the effusion filled up so much of the Canal of the Instestine, as to render it difficult to pass a small Probe through the constriction.

The Hernial Sac, in this species of Hernia, is subject to chronic inflammation, by which it is much

thickened, and sometimes becomes of a cartilaginous consistence.

Strangulation more readily takes place in this than in other Herniæ, and is often so perfect, that it acts like a tight ligature, producing the almost immediate mortification of the protruded bowel: Hence, in my former book, I observed that, in general, the difficulty and hazard of performing the operation for Crural Hernia, deter the surgeon from having recourse to his operation in due season. From the annexed plates, we learn that if the operation be postponed until a considerable degree of inflammation has affected the Herniary Sac, it will be often impracticable to reduce the bowels, as an effusion of coagulable lymph, which forms a bond of union between the Herniary Sac and Bowels contained within it, very soon succeeds the inflammation, especially in Crural Hernia, which is very apt to terminate in mortification.

Mr Astley Cooper's opinion on this point, is still more decided. After mentioning instances of the fatal effects of postponing the operation, he has added, " So strongly am I impressed with this belief, that if I were myself the subject of Crural Hernia, I should only try the effect of tobacco clysters, and if they did not succeed, would have the operation performed *in twelve hours* from the accession of the symptoms."

Diagnosis of Crural Herniæ.

The general or sympathetic symptoms of all kinds of Hernia are nearly the same.

On account of the very small size and flatness of the Tumour in Crural Hernia, it often is very difficult, by an examination of it, by pressure with the fingers, to discover the disease, or to ascertain the nature of the contents of the Tumour, as may generally be done in Scrotal or Umbilical Hernia, to which the vicinity of the Tumour to the neighbouring Lymphatic Glands also contributes; for one or more of the Inguinal Lymphatic Glands are situated at the sides, or lie over the Herniary Sac. Vid. Plate XIII. fig. 4th.

A swelling of the Inguinal Lymphatic Glands bears a very strong resemblance to a Crural Hernia which contains Omentum. Besides, some of the smaller Inguinal Glands frequently cover the Hernial Tumour. In both of the above cases, the Hernial Tumour has not its usual characters, Elasticity and smoothness of surface.

Hernia may be distinguished from a Venereal Bubo, by attending to the peculiar origin and feeling of the Tumour, and the progress of it towards suppuration.

In the latter, the Tumour, is harder, swells gradually, is scarcely moveable; is invariably of the same size, is seated in the uppermost cluster of

Inguinal Glands, does not by pressure disappear, or become less, and does not increase in size by the patient coughing.

The Hernial Tumour commonly appears suddenly after some violent exertion, as raising a heavy weight, or from a fit of coughing, or vomiting, and increases or diminishes in bulk by pressure, or when the patient goes to bed.

In many cases of Crural Hernia, the Tumour is so small, that an opinion is formed respecting the nature of the disease, rather from the concomitant symptoms, than from the sensible qualities of the Tumour.

The symptoms of strangulation coming on, remove all doubt respecting the nature of the case.

Notwithstanding these and other marks of distinction, a Crural Hernia has been mistaken for a Scrofulous enlargement of the Inguinal Glands, or a Venereal Bubo for a Hernia.

At the Dispensary, I met with a case, which at first sight was puzzling.

A girl, about fourteen years of age, presented herself, who had a swelling in her Groin, which she said had appeared very suddenly, and which was extremely painful upon being touched. It was not in the least discoloured.

Upon examining her, I perceived, that the swelling lay nearer to the Anterior Spinous process of the Ilium than the Crural Ring.

Upon a still more accurate examination, I disco-

vered that the inferior cluster of Inguinal Glands was considerably enlarged, as also those lymphatic vessels which pass from the Glutei Muscles into the upper cluster of Inguinal Glands, and it did not occasion sickness or costiveness.

This determined the nature of the disease, which was treated as Scrofulous.

Mr Else met with a Crural Hernia placed behind a swelled suppurating lymphatic Gland of the Groin.

In such a complicated case, the Surgeon may wound the Intestine in opening the abscess.

A quantity of fat, or a collection of Hydatids on the inner side of the Groin, bears some resemblance to a Herniary Tumour, as the watery fluid within the elastic Coats of the Hydatid, communicates to the sense of touch nearly the same sensations as a protruded portion of Intestine.

In the Museum of the University of Edinburgh, there is a Sac, the size of an hen's egg, and containing a quantity of Hydatids, which was removed from the upper and inner parts of the Thigh.

A case somewhat similar is described in Dessault's Chirurgical Journal, by Mr Manoury. A large Hydatid lay over the place, where the bowels protrude in cases of Inguinal Hernia, and had been mistaken by a Surgeon for Hernia.

Lumbar Abscess may be very readily mistaken for a Crural Hernia, for it becomes larger when the person coughs, and also more tense in the erect than in the horizontal posture.

The characteristic symptoms of Lumbar Abscess are, the symptoms of inflammation in the side or Loins, followed by those which indicate the formation of purulent matter; pain increased on motion; the slow and gradual increase of the Tumour, the limits of which are not well defined; the fluctuation of matter felt, on alternate pressure being made on the Loins, or lower part of the Abdomen, and upper and inner part of the Thigh, when the swelling is examined alternately in the erect and horizontal posture, and the absence of such symptoms as denote a derangement in the functions of the Intestines.

A Crural Hernia of a large size, which is reflected upon the Crural Arch, is placed obliquely, and the neck of it being compressed, and somewhat resembling the Spermatic Cord, may be mistaken for an Inguinal Hernia, as it covers the Under Abdominal Aperture.

A Crural Hernia is sometimes reflected upwards and outwards, sometimes upwards and inwards.

In order to ascertain the nature of the Hernia, it sometimes becomes necessary to turn downwards the folded part of the swelling; when, by grasping Poupart's Ligament, just over the Crural Aperture, the Herniary Tumour may be traced to the Crural Aperture; but this cannot always be done when the disease has been of some duration; as during the progress of the disease, the Tumour may be retained in its unnatural situation by adhesions.

It is of great moment that the kind of Hernia should be ascertained, as the mistaking one species for another, may not only prove injurious to the reputation of the Surgeon, but also, in the case of an operation, fatal to his patient.

A varix or swelling of that part of the Femoral Vein which is next to the Crural Arch, expands when the patient coughs, becomes much less in size on the recumbent, and expands in the erect posture, and hence has been mistaken for a Crural Hernia, to which it bears a strong resemblance.

A swelling occasioned by such a cause, may be discovered, according to Mr Cooper, by making pressure upon the Vein above the Crural Arch, and retarding the return of blood: thus the Tumour reappears, which had disappeared when the patient was in the recumbent posture.

Mr Astley Cooper describes a Steatomatous Tumour, which occupied the place of a Crural Hernia*

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* Vid. Cooper. Vid. Ludwig, Ade. Med. Pract. V. 1.

EXPLANATION OF PLATE XII.

Fig. I.

Represents a strangulated portion of Intestine, which was of a deep purple colour, and the surface of it was covered by a very thin layer of coagulable lymph.

The letters AA, point out the marks of the stricture.

B, a portion of the mesentery.

Fig. II.

Represents four Herniary Sacs. The largest, A, which Mr A. Cooper thinks is the Fascia Propria, was filled with bloody water. A part of this Herniary Sac was removed to show two smaller Sacs, B and C, within it: these seemed to be separated from each other by the septum D, which is very thin posteriorly.

E, a small Sac at the side of the largest Sac A.

The Sacs A and E communicate laterally at L; as may be seen by the light coming through the opening.

The Hernial Sacs B and C do not communicate with each other.

The Sac B communicates with the Sac A, by a

Fig. 1.

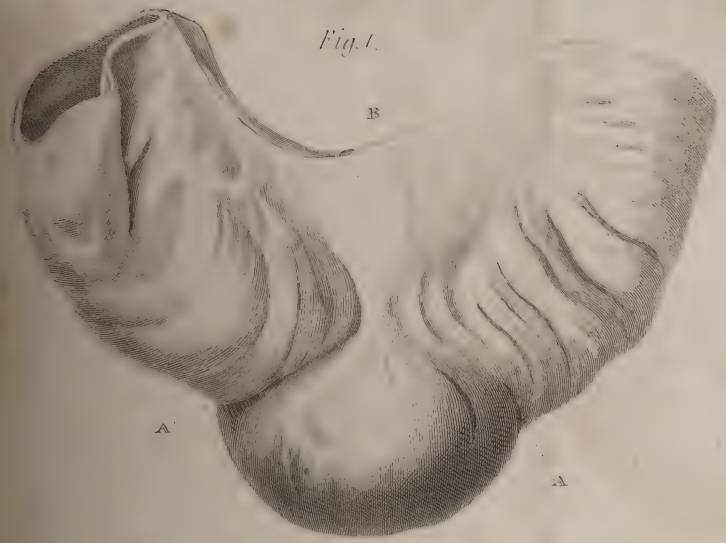


Fig. 2.

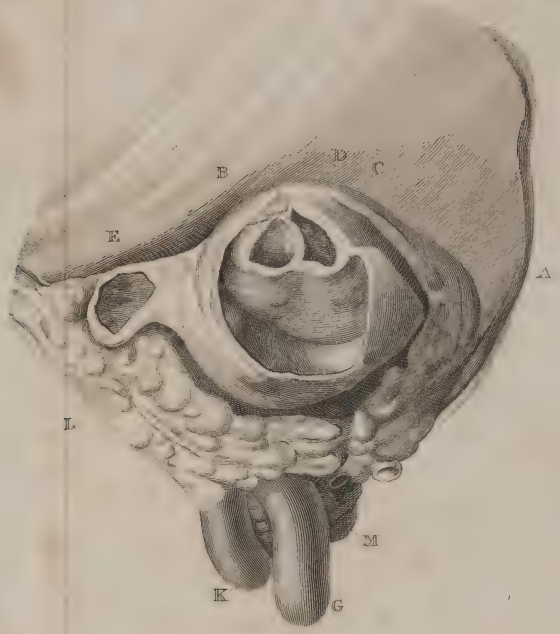
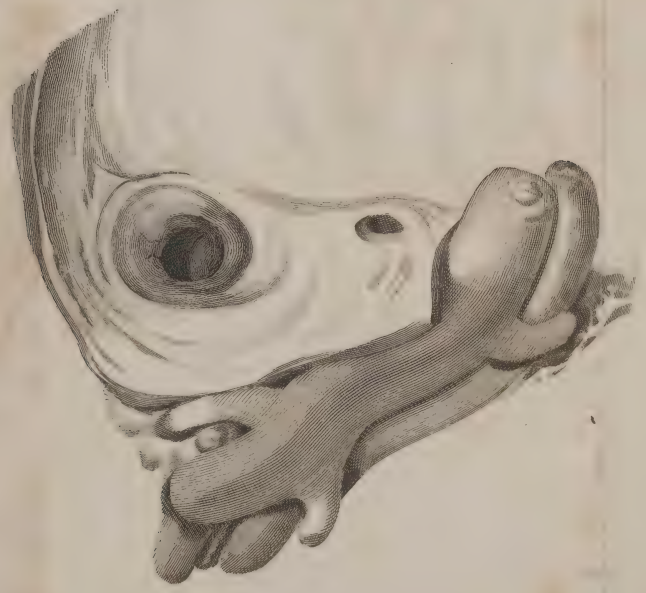


Fig. 3.



Heath fc.

small rounded opening in the posterior part, which cannot be represented in this view of the parts.

Condensed Cellular substance and fat surrounded the Herniary Sacs.

GK, the Femoral Artery, and its great branch, the Arteria Profunda.

M, the Femoral Vein.

FIG. III.

Represents an inside view of the same preparation from which fig. 2d was taken.

The communications of the Hernial Sacs with the cavity of the Abdomen, are seen.

EXPLANATION OF PLATE XIII.

Fig. I.

Gives an inside view of the left side of the Pelvis of a woman.

The reader is supposed to be looking obliquely down towards the fore-part of the Pelvis.

P, The Peritoneum, which covered the Anterior Iliac Artery and Vein, and the adjacent parts.

A, the round Ligament of the Uterus passing in a Canal; the posterior part of which is strengthened by the under portion of the internal edge of the Crural Arch.

a, b, c, d, point out the inner side of Poupart's Ligament, or the internal edge of the Crural Arch: c and d represent the portion divided by Gimbernat in his operation for Crural Hernia.

CDN, the tendinous Aponeurosis covering the internal Iliac Muscle, consisting of fibres running longitudinally; others pass transversely; it is interwoven with the Crural Arch in such a manner, as is seen at D and E, that Herniæ can happen only on the Pubal side of the Anterior Iliac Vein.

A part of the tendinous Aponeurosis covering the Iliac Muscle, passes behind the Anterior Iliac Artery K, and its corresponding vein L; which tendinous Aponeurosis is inserted into the edge of the Pectineus Muscle, and is attached to the Pubes, where

PLATE XIII.

Fig. 1st

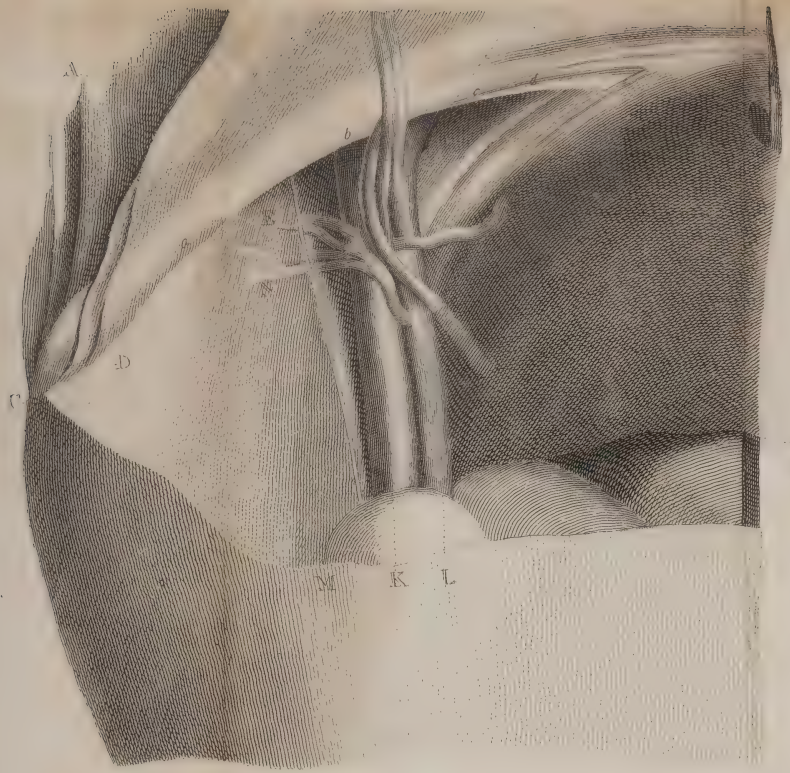
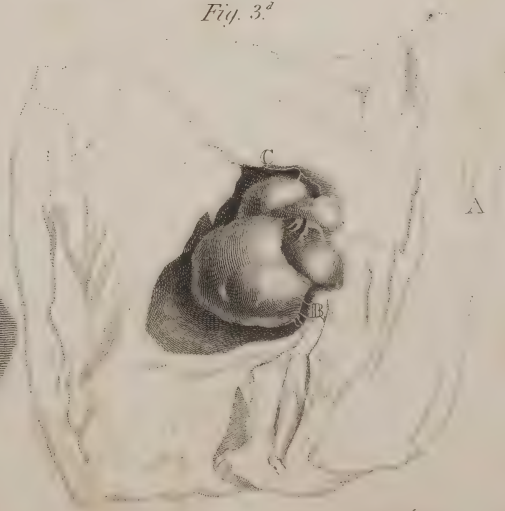


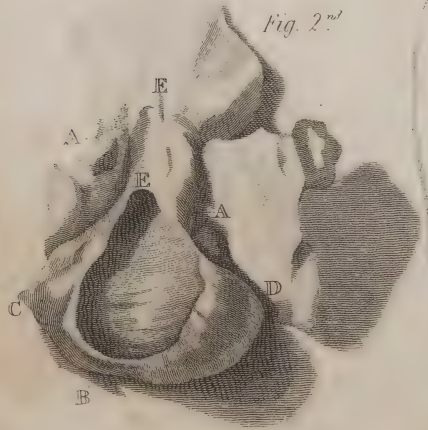
Fig. 3.d



Heath sculp.

Fig. 4th

Fig. 2nd



it is united with the duplicature of the arch pointed out by the letters c, d.

One of the Crural nerves is seen passing on the Ilial side of the Anterior Iliac Artery K.

The Epigastric Artery is sent off from the anterior Iliac Artery K, before it enters the sheath; and, with its corresponding vein, passes obliquely inwards, on the inner side of the round Ligament of the Uterus A. The Obturator Artery is seen passing inwards to the Foramen Obturatorium: in this instance, it arises from the same part of the Anterior Iliac Artery, as the Epigastric Artery.

The circumflex Artery E passes outwards.

An Aperture on the inner side of the Anterior Iliac Vein L, which is in some subjects filled up by a small lymphatic Gland; through this the bowels protrude, and form a Crural Hernia.

The Anterior Iliac blood-vessels K and L fill up the principal part of the orifice of the sheath: the round Ligament of the Uterus A shuts up a little of the external side of it.

The Epigastric Artery and Vein cover its anterior and internal part, on their way to the Rectus Muscle of the Abdomen.

The parts represented in this engraving have been reduced to two-thirds of their natural diameter.

Fig. II.

Represents a Sac of a Crural Hernia of its natural size, in order to show its peculiarities, viz. the length

and narrowness of the neck of the Sac, and also that the breadth of the body of the Sac, or distance between C and D, is greater than its length, or the distance between E and B.

It adhered to the neighbouring Fat and Cellular substance: hence it appears considerably thicker in some places than others.

A, its narrow neck.

B, the cavity of the Sac perfectly smooth when it was first opened; but is now a little corrugated, from having been preserved for a long time in spirits.

EE, Point out the length of the neck of the Sac, which is of an uniform diameter. The uppermost E marks the most frequent seat of strangulation in a Crural Hernia, which is deeply seated. Above the uppermost E, the Peritoneum is represented.

FIG. III.

Represents that variety of Crural Hernia in which the Tumour bears a very strong resemblance to enlarged Inguinal Glands, in consequence of a part of the Hernial Sac having passed through the Superficial Fascia.

A, The region of the Pubes.

B, The Vena Saphæna Major, where it is about to join the deep Femoral Vein.

C, Part of the Falciform process of the Fascia Lata.

FIG. IV.

This preparation of Crural Hernia was obtained from the body of a woman of seventy-two years of age, whom I attended along with Messrs WARDROP.

The Hernial Tumour, which was remarkably irregular on its surface, was reflected upwards and outwards upon the Crural Arch, viz. towards the anterior Spinous Process of the Ilium, and was retained in that situation by unnatural adhesions.

A, A, Represent the Sac of the Hernia cut open, which was covered by several Lymphatic Glands of different sizes, marked by the letters D, D, F, E. The largest Lymphatic Gland, F, lay transversely across the Hernial Tumour.

From the inner surface of the Hernial Sac, there grew a number of small Tumours, the largest of which is marked by the letter B.

Within the Hernial Sac, there was a portion of Intestine, of the colour of coagulated blood, which adhered intimately to the inner surface of the Sac; and also a small quantity of bloody water.

The figures II, III, and IV, of this Plate, are of the size of nature.

EXPLANATION OF PLATE XIV.

Fig. I.

In this front view, the relative situation of the Crural Herniary Tumour with respect to the Inguinal Canal, round Ligament of the Uterus, neighbouring blood-vessels and nerves, on the right side of the body, is seen.

The parts are represented of their natural size.

A, The Herniary Tumour.

B, The neck of the Tumour.

C, The Femoral Artery. The anterior Crural nerves are seen on the outer side of the Artery.

D, The Femoral Vein.

E, The Vena Saphæna.

A portion of the Abdominal Muscles was cut out, in order to show the situation and course of the Epigastric Artery, G.

H, The Round Ligament of the Uterus crossing the Epigastric Artery.

I, The under part of the Rectus Abdominis.

K, A Tendinous Membrane turned back, which covered the Rectus Abdominis.

MNO, The under part of the tendon of the oblique Muscle, called Crural Arch.

P, The Under Abdominal Aperture.

Fig. II.

This figure represents the Sac of a Crural Hernia opened, the contents of which were, a process from

PLATE XIV

Fig 1st

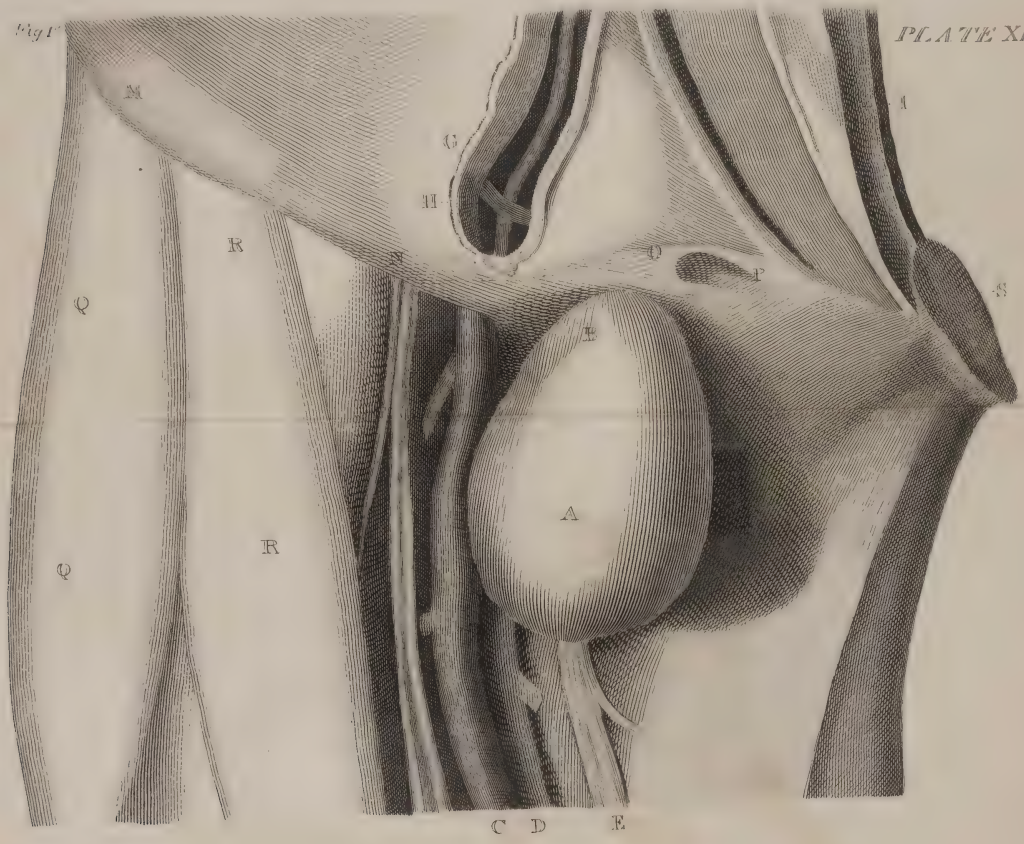
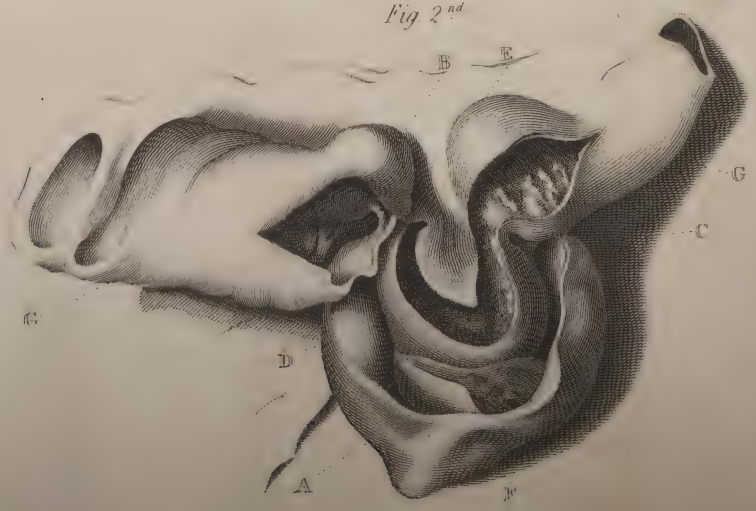


Fig 2nd



Heath fc

a portion of the smaller Intestine, which I formerly named Diverticulum, and a small quantity of bloody water.

The neck of the Diverticulum had been very much compressed, and it was in part filled, as the Intestine to which it is attached, by coagulable Lymph.

The Sac A adhered to the neighbouring fat; and therefore appears uneven on its surface, and much thicker in some places than in others.

The neck of the Sac was narrower than any other portion of it. The engraving represents the Sac after it was opened; in consequence of which, the opposite sides of it have receded to a considerable distance from each other.

An appendix or Diverticulum from the Intestine which was fixed to the bottom of the Herniary Sac AA, by means of a layer of coagulable Lymph, F.

The protruded portion of Intestine had dragged down along with it a portion of the mesentery B.

The cavity of the protruded portion of Intestine was nearly filled by coagulable Lymph, except at that part of it represented by the letter C.

At the letter E, there was so complete an obstruction, that not even a small probe could be passed from the upper to the under part of the strangulated Intestine.

F, A layer of coagulable Lymph uniting the protruded portion of bowel to the Herniary Sac.

EXPLANATION OF PLATE XV.

Fig. I.

Gives an inside view of the right side of the Pelvis of a woman, who died in consequence of Crural Hernia. The Abdominal Muscles AA were turned forwards.

B, The under part of the Rectus Abdominis.

CC, A part of the Iliacus Internus Muscle.

D, A part of the Psoas Muscle.

E, The Anterior Iliac Artery.

In this case, the Obturator and Epigastric Arteries arose from the common trunk F.

G, The Obturator Artery passing behind and on the Ilial side of the neck of the Herniary Sac, to pass through the Foramen Obturatorium, I.

K, The Epigastric Artery passing on the Ilial side of the Herniary Sac, and crossing the round Ligament of the Uterus.

M, The circumflex Artery passing outwards, and towards the Os Ilium.

N, A small nerve, derived from the Lumbar Nerves, passing along the Iliacus Internus Muscle.

In this instance, the parts are nearly of their natural size.

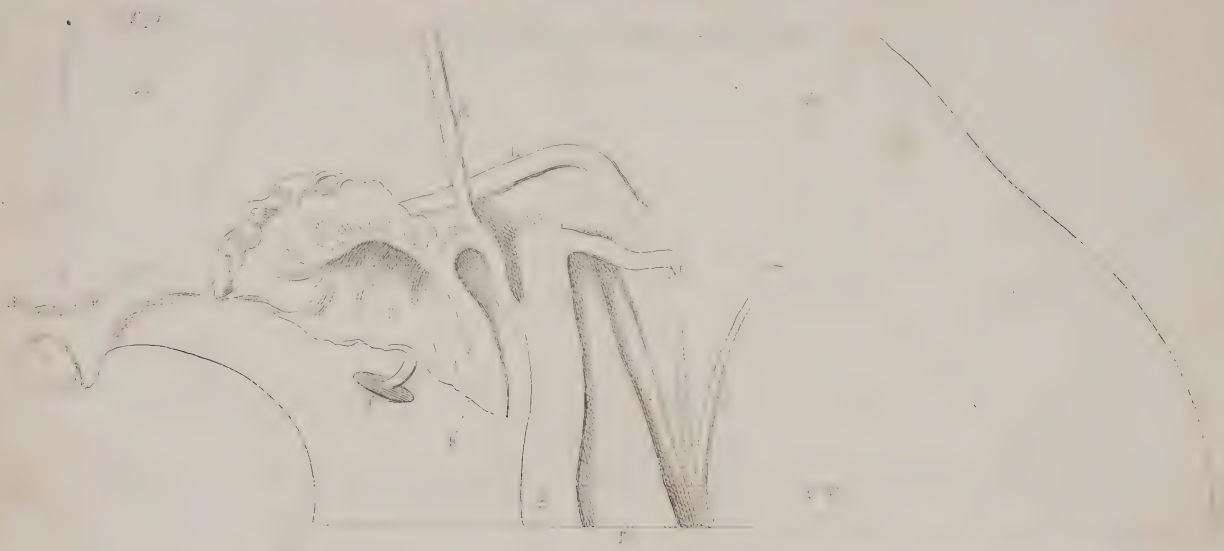


FIG. II.

Gives an inside view of the left side of the Pelvis of the male.

The parts in the plate are represented of their natural size.

AAA, Point out the Abdominal Muscles turned forwards and downwards.

B, A portion of the Iliacus Internus Muscle.

C, A portion of the Psoas Magnus Muscle.

D, The Anterior Iliac Artery.

E, The Circumflex Artery.

F, The Epigastric Artery.

G, The Anterior Iliac Vein.

H, The Epigastric Vein.

I, The Spermatic Cord.

G, The Vas Deferens.

KKK, Nerves from the Lumbar Plexus.

LMN, The internal edge of the Crural Arch.

That part, marked N, called by some GIMBERNAT's Ligament, is much broader than in the female Pelvis.

The Aperture X on the internal side of the Anterior Iliac Vein is of a different shape and size from that of the female Pelvis.

O, The crest of the Pubes.

EXPLANATION OF PLATE XVI.

Fig. 1st of this Plate represents a small Omental Hernia, which had passed from the sheath of the Lymphatic vessels which is placed immediately under the letters F, G, and E, into the cellular sheath of the femoral blood-vessels.

A, The anterior superior spinous process of the Ilium.

B, The region of the Pubes.

C, The superficial Femoral Artery,

D, The Vena Saphæna Major, where it joins with the Femoral Vein.

Fig. II.

Represents two Hernial Sacs, the one of which is contained within the sheath of the Lymphatics, and the other within the cellular sheath of the Femoral blood-vessels.

A, The anterior spinous process of the Os Ilium.

B, The region of the Pubes.

C, The under Abdominal Aperture.

D, The Vena Saphæna Major going to join with the Femoral Vein.

E, The Pubal portion of the Fascia Lata.

F, H, The Ilial portion of the Fascia Lata.

K, The Obturator Artery passing between the Hernial Sacs, and surrounding the Ilial Tumour.

PLATE XVI

Fig. 1.

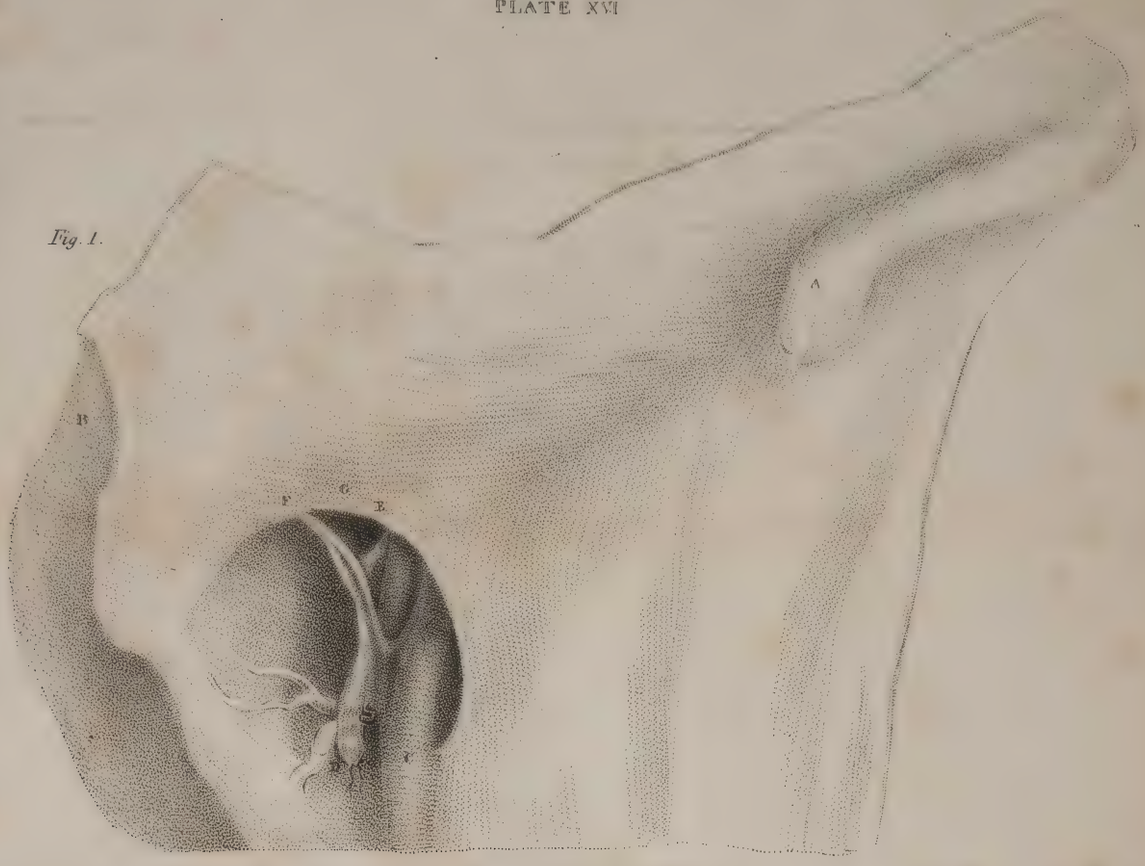


Fig. 2.

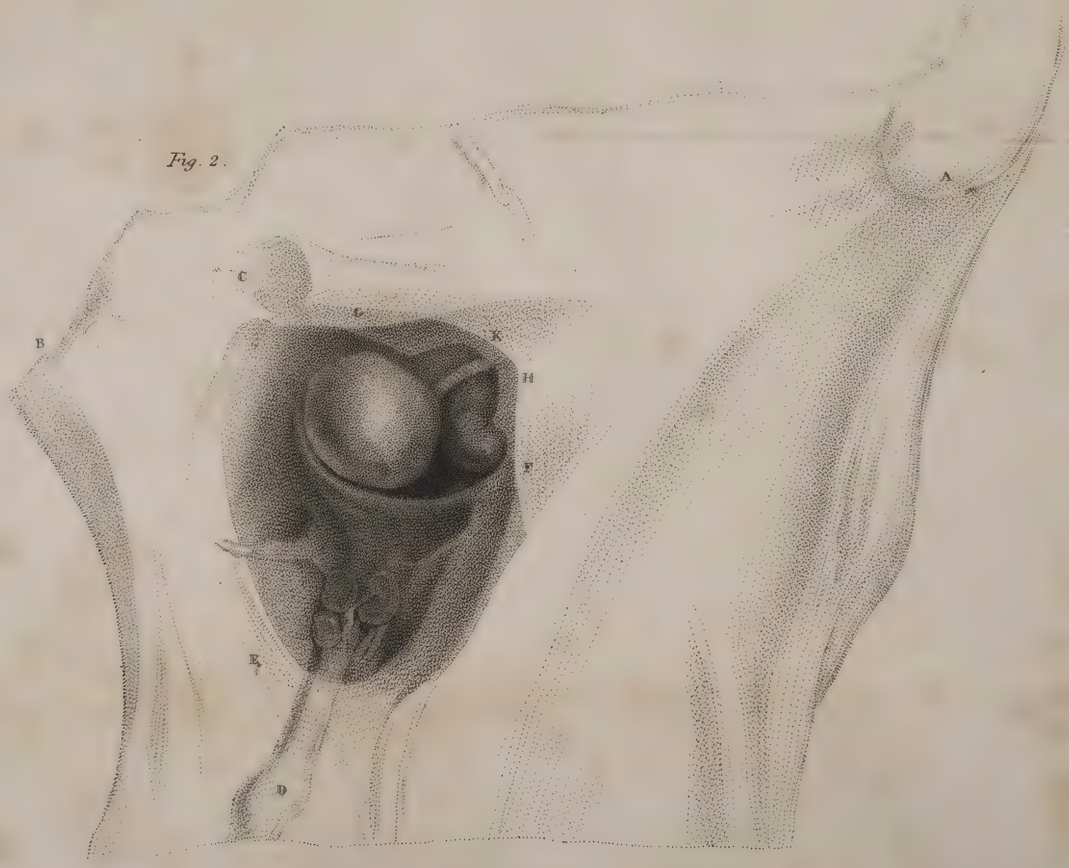


Plate XVIII.

EXPLANATION OF PLATE XVIII.

REPRESENTS that kind of Crural Hernia, but only half the size of nature, in which the Tumour is reflected upon the Crural Arch.

A, The Anterior Spinous Process of the Os Ilium.

B, The region of the Pubes.

C, The Thigh.

DD, The Skin, Cellular Substance, and Superficial Fascia, turned back, which covered the Hernial Tumour.

E, The Hernial Tumour, the Sac of which was so remarkably thin, that the turns of the contained Intestines are seen through it.

F, A piece of string supporting the Hernial Sac.

G, The protruded Intestines.

H, The Vena Saphæna.

K, The UNDER ABDOMINAL APERTURE.

Of the Umbilical Hernia.

By this term is to be understood a protrusion at the Navel, or at the side of it, of some part of the contents of the Abdomen.

It has been matter of much dispute amongst authors, whether the protrusion more frequently takes place in the middle, or at the side of the Navel. As far as I have observed, in infants, the protrusion generally takes place through the very centre of the Navel.

This species of Hernia, like every other, originates from any cause which diminishes the resistance of the Parietes of the Abdomen, or increases the pressure of the contained bowels.

The disease is most prevalent amongst children who have large Navels, because the Umbilicus is a kind of cicatrix, and is therefore weaker than any other part of the Parietes; and besides, the Navel is not supported by tendon, but merely by skin and condensed Cellular Membrane; and the disease commonly appears when children are a few days old, before the parts have acquired the proper firmness, and when the bandage, which nurses commonly apply to the Navel, has been removed.

I have been informed by Dr Forbes, who spent many years in the West Indies, that nearly two-thirds of the Negro children are afflicted with Umbilical Hernia.

When the Hernia appears during infancy, it generally assumes an oblong form, and is nearly of an uniform diameter, the Sac is very thin, and it is included in a portion of skin.

Even after the Tumour has appeared, the disposition to contract is so great, according to DESAULT, that the contents of the Cavity of the Abdomen, when protruded, have been forced back into their original situation, and a spontaneous cure is effected.

Internal distention, creating an increased pressure against the Parietes, also gives occasion to Umbilical Hernia; hence the disease sometimes shows itself some months after birth, during the Hooping-Cough, or after a violent fit of crying, coughing, or vomiting.

Any cause which leads to the enlargement of the Umbilical Ring, may occasion an Umbilical Hernia; hence Umbilical Hernia sometimes shows itself after delivery, and sometimes after tapping for Dropsy of the Belly, or it proceeds from excessive corpulency, owing to the previous dilatation of the Umbilical Ring.

When the cavity of the Abdomen of children becomes Dropsical, the Navel is frequently protruded to a considerable extent; and, on account of the transparency of its coverings, the contents of the Tumour may be seen.

For the same reason, pregnant women are disposed to the Umbilical Hernia, in consequence of the enlargement and weakness of the Umbilical

Ring, and also from the bulk of the Gravid Uterus, displacing the bowels of the Abdomen, and pressing these against the Parietes. That the Umbilical Hernia is connected with extension and weakness, rather than muscular exertion, is obvious from the disease preceding the labour pains, and being connected with extreme corpulency, Ascites, and Dropsy of the Ovarium.

The Umbilical Hernia, when of considerable duration, and unsupported, sometimes attains a very large bulk, and hangs downwards towards the Pubes, occasioning habitual Colic. I have also sometimes seen this Hernia of a pyramidal figure, and with a very broad basis.

Mr Cooper observes, that there is sometimes an appearance of two Tumours.

Some have affirmed, that the contents of the Hernial Tumour pass through the Peritoneum, or that the Umbilical Hernia is a *true Rupture;* an opinion which is grounded upon error, as the Peritoneum *is not perforated by the Umbilical Vessels.*

In this species of Hernia, the Hernial Sac is generally very thin, and contracts a very intimate union with the superincumbent Cellular Membrane, fat and skin, so that it is very difficult to separate the one from the other: which circumstance has probably led to the opinion of their being no Sac. Great caution is therefore necessary in laying open the Hernial Sac, in operating for the cure of this kind of Hernia.

Mr Astley Cooper informs us, that portions of the Sac have sometimes been removed by absorption, so that the contents of the Tumour adhere to the skin, and a part of the displaced Bowels which has passed through the Sac, has been strangulated at the Aperture.

During infancy, this kind of Hernia is frequently connected with malconformation, originating from a deficiency in the Parietes of the Abdomen.

The Tumour, which is very various in size, appears to be a dilatation of the Umbilical Cord, and on account of the thinness and transparency of its coverings, its contents are visible.

Of the Contents of the Umbilical Hernia.

The Omentum, which covers a part of the Intestines, and is unattached at its lower part, generally forms a considerable share of the contents of an Umbilical Hernia, and as it is generally kept in immediate contact with the same part of the Sac, it frequently adheres to it. In some instances, a turn of the Ileum alone has been found in the Hernial Sac, or the Transverse Arch of the Colon.

The bowels in this kind of Hernia very frequently contract adhesions to each other, and to the Hernial Sac, so that it becomes impossible to reduce the bulk of the Tumour.

Sometimes a Tumour grows from the Navel, which

somewhat resembles an Umbilical Hernia. I met with a case of this description, in which a Tumour, the colour of a strawberry, was situated in the Navel, and which was removed by the application of the Sulphat of Copper.

A large collection of Hydatids within the Liver, or Hydatids growing from the surface of that organ, sometimes give rise to a Tumour at the side of the Navel, which by the inattentive, may be mistaken for an Umbilical Hernia.

Of the Congenital Hernia of the Male.

The Congenital is a modification of the Inguinal or Scrotal Hernia.

The name implies, that the disease shows itself at, or soon after birth, but this name is exceptionable, as it gives an incorrect idea regarding the nature of this disease, which is much more frequent a short time after, than at the time of birth, and sometimes shows itself during manhood. This kind of Hernia, therefore, should be called the Vaginal, instead of the Congenital Hernia, and it is necessary to add, of the Male, to distinguish it from the Vaginal Hernia of the Female; as the protruded bowels are in immediate contact with the Testicle, owing to the passage through which the Testes had passed remaining open, and as the Vaginal Coat of the Testicle forms the Hernial Sac.

In this Hernia, the displaced bowels are situated within the Canal, through which the Testes pass from the Abdomen into the Scrotum, which, though commonly obliterated, sometimes remains open during the whole of life.

The nature of this kind of Hernia was long unknown. We are chiefly indebted to Baron HALLER, WRISBERG, Mr POTT, and to Dr and Mr J. HUNTER, for our knowledge on this head.

There is much irregularity as to the period at which the Canal, through which the Testes pass, is obliterated.

Dr CAMPER has published the following observations on the subject; he examined for that purpose the bodies of seventeen new-born male children. In eleven, the Canal was open on both sides; in three, a portion on the right side was open; and in two, a portion on the left side was open; and in one only, the Canal was obliterated on both sides.

Professor WRISBERG also has published many valuable observations on the descent of the Testis, to which I beg leave to refer the reader*.

There is frequently a stricture in the middle of the Canal through which the Testes pass.

In a case of this description which I dissected, there was a stricture in the middle of the Canal, and a part of the Omentum had got beyond the constric-

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* Vid. Comment. Soc. Reg. Scient. Gotting.

ted part of the Canal, and had attained an unnatural bulk.

The Canal for the Testes has been sometimes observed to be contracted at its upper, and also in its under parts, and sometimes, according to Dr WRISBERG, in two different places at the same time.

Sometimes the Testicles are detained in the Groin, and have been mistaken for an Inguinal Hernia, and upon that supposition, trusses have been worn.

The size and figure of this Hernia is various, and depends upon the situation of the stricture in the Canal; should the stricture be seated near to the under part of the Scrotum, the Hernial Tumour then assumes an oblong figure, and is equally large in its upper, as in its under part, and the Tumour passes out perpendicularly from the Abdomen; because in a child at birth, the Spermatic Cord does *not pass obliquely through the Parietes of the Abdomen*, as in the adult, but passes directly through these, and hence the peculiar shape of the Herniary Tumour.

LOBSTEIN has described a case of Congenital Hernia, in which the Tumour descended as low as the knee.

The Sac of the Congenital Hernia sometimes acquires a preternatural thickness, sometimes it is of an unusual thinness. Mr ARNAUD relates a case, where the Sac was so thin, that he divided it, in making the incision through the skin, and with difficulty could find it out afterwards.

The Sac, which is of an oblong figure, is covered

by the Cremaster Muscle, and the thin Fascia of the Abdominal Muscles.

On account of the greater shortness of the Omentum of children, that organ is seldom contained within the Hernial Sac.

As life advances, in consequence of the Omentum being elongated, it gets into the Hernial Sac, which originally contained only a portion of the small Intestine.

Mr A. Burns communicated to me a case, which forms an exception to the above observation. He met with an instance in a new born child, of the Omentum, which had previously adhered to the Testicle, being dragged from the Abdomen, along with that organ.

It sometimes happens, as in a case related by Mery, in the Academy of Sciences at Paris, 1701, that the Omentum which had been displaced, has involved the Testicle, which led the Surgeon to suppose that the patient was afflicted by a Sarcocele. Meckel relates another effect of adhesion between the Omentum and Testicle.

If the Testicle, before it has reached the Scrotum, contracts an adhesion with the other Viscera of the Abdomen, it may retard, or may prevent the descent of the Intestines.

Wrisberg has described several cases, in which the patients afflicted by this variety of Hernia, which was reducible, suffered the most excruciating pain whenever the Hernia was reduced, which was found

to have originated from a preternatural adhesion between the Testicle and the Omentum.

Dr Wrisberg, and Mr Pott, also make mention of the intimate connection between the protruded Bowels, and the Testicle, and also of the difficulty of disuniting them.

When the Testicle has descended no lower than the Under Abdominal Aperture, it sometimes happens that the Intestine slips past it into the Scrotum.

Mr Pott met with two such cases; the patients could not wear a bandage, on account of its pressure on the Testicle. Sometimes the Testicle in the Groin has proved a cause of strangulation.

This species of Hernia may generally be distinguished from the Scrotal, from the difficulty of distinguishing the Testicle, which is involved by the protruded parts.

It may not be improper to add a circumstance respecting Congenital Hernia, which was lately communicated to me.

About four years ago, a Surgeon was desired to reduce a Congenital Hernia in a boy of six years old; he did so, and along with the bowels, he pushed back the Testicle into the Abdomen, which has never since passed into the Scrotum.

It sometimes happens, that the Congenital Hernia is complicated with a Hydrocele. In that particular case, the water collected within the Vaginal

Coat, by change of posture, readily returns into the cavity of the Abdomen.

Of the Varieties of Congenital Hernia.

Mr HEY *, and Mr FOSTER †, have described an unusual variety of Congenital Hernia, in which the protruded bowels, with their containing Sac, were included within the Tunica Vaginalis Testis.

This kind of Hernia was probably occasioned by the Canal, through which the Testes pass, being shut in its upper part, whilst its lower part remained open.

Of Congenital Hernia of the Female.

In the observations on Crural Hernia, which I formerly published, I observed, that infants of the female sex may be afflicted by Hernia Congenita, as there is a Canal formed by the Peritoneum, which passes through the UNDER ABDOMINAL APERTURE, over the round Ligament of the Uterus. This Canal is about half an inch in length, and terminates in a blind Sac at the Groin.

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* Vid. his Practical Observations.

† Vid. Mr ASTLEY COOPER, Part I. p. 59.

Nuck* is the first author who has described this Canal; he called it a Diverticulum. Some authors had entertained doubts upon this point of Anatomy, until Camper † and Wrisberg ‡ examined the subject with attention.

Camper found the above-mentioned Canal open in three of fourteen female infants after birth; and adds, that he had discovered traces of it in women after delivery.

Wrisberg observed the Canal of different sizes, and open in nineteen out of two hundred children.

Le Cat observed it in a woman of forty-six years of age, of the size of a goose quill.

Mr A. Burns, in two cases of Ascites, found this Canal so much enlarged, as to admit of the introduction of the thumb.

I have subjoined a letter which I received of Mr A. Burns of Glasgow, descriptive of the Congenital Hernia of the female.

"I have now examined seven cases of this kind, and in six have found the anterior side of the Inguinal Canal deficient. The instance in which I found this species of Herniary Sac not conjoined with imperfect formation of the Inguinal Canal, was in a girl aged thirteen years. Although I have once

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* Vid. Adenographia Curiosa, Cap. 10.

† Haarlem Trans.

‡ Wrisberg, de Test. descens.

met with a Congenital Hernia without deficiency of the anterior side of the Canal, yet I have never had occasion to notice any case in which this deficiency existed, and was not complicated with Congenital Hernia.

" In one of the subjects with Congenital Hernia, the Sac did not escape from the Canal; in five, it had, from the peculiar state of the Canal, descended along the Thigh, assuming to a great degree the resemblance of Crural Hernia, and in one, it was bound down by the superficial Aponeurosis of the external oblique. In this person, the oblique Aponeurosis had come in reality to supply the place of the anterior side of the Canal; it was so strong, that it resisted the passage of the Tumour down along the thigh; it led it down to the upper part of the Labium Pudendi.

" This was not the only peculiarity of this case; for the Tumour in its course to the Labium, insinuated itself between the fillets of the upper pillar of the Canal, and at that point was strictured by this fillet. There was also a very obvious narrowing at the part where the Sac escaped from the deficient Canal. The stricture was formed by the interlacing fibres of the external oblique; a fact which proves, that the deficiency of the Canal does not depend on the want of these fibres.

" In Congenital Inguinal Hernia the risk is, that we mistake the disease for Crural Hernia. It has been seen, that the Tumour in the former, owing

to the imperfect state of the anterior wall of the Canal, comes, in the majority of cases, by separating the fibres of the oblique Aponeurosis, to place itself, in so far as regards the course of the swelling, in the situation of a Crural Hernia."

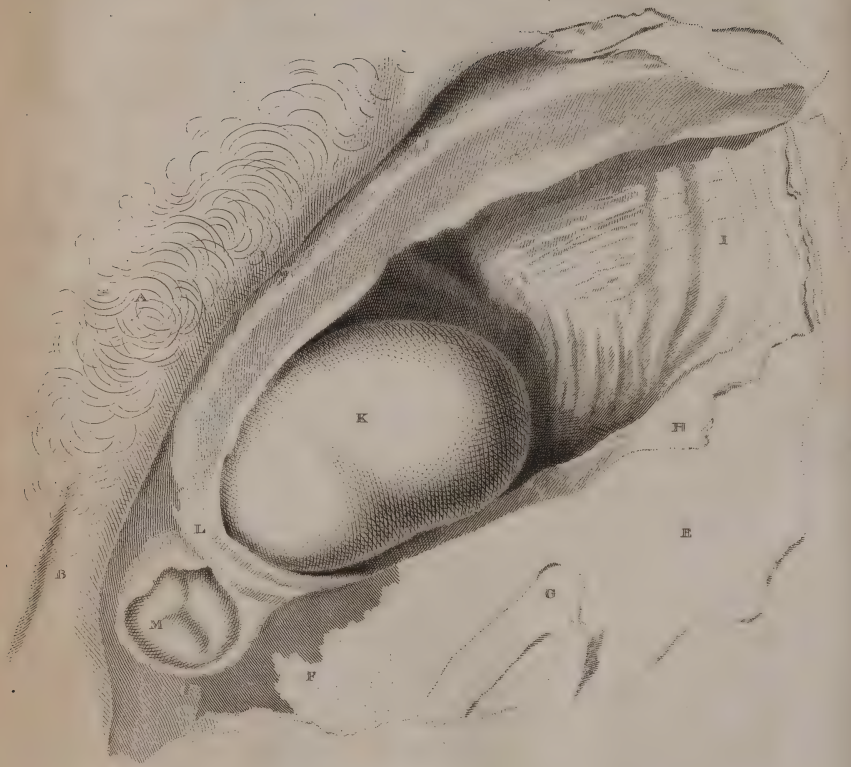
There are many examples within my knowledge, where this mistake was never discovered till after the operation had been performed. Generally, it is unpardonable in a Surgeon to confound the one disease with the other.

He can never, indeed, be excusable, unless where the parts around the Sac are so swelled and diseased, that there is no possibility of distinguishing Poupart's Ligament.

In Congenital Inguinal Hernia in the female, I have found that the Tumour, when it descended along the Thigh, lay above the Adipo-Glandular Fascia, so that it was more defined and superficial than in Crural Hernia. I may add, that in the case from which the annexed Plate was taken, no one could, previous to the exposure of the parts by dissection, have conjectured that the anterior side of the Canal was so extensively wanting. This arose from the unusual resistance afforded by the oblique Aponeurosis; a resistance which prevented the descent of the Sac along the Thigh.

Where the deficiency of the Canal was great, and the Hernia large and reducible, I have found that the finger could be made to follow the Bowels, and so could be turned into the Crural Foramen.

PLATE XIX.



A. Fyfe del.

E. Mitchell Sculp.

Dr Thomson has noticed the same fact, which, I would observe, has never, to my knowledge, been pointed out by any author*.

EXPLANATION OF PLATE XIX.

A, The Mons Veneris.

B, The left Labium Pudendi.

E, The Fascia Lata of the Thigh.

F, The Pectineal Aponeurosis.

G, The Vena Saphæna, perforating a mass of fat to get beneath the Falciform Process.

H, The Aponeurosis of the external oblique Muscle, which, in this subject, was peculiarly strong and very thick.

I, The Tendon of the External Oblique, which

* It may be proper to add, that the case, described by Mr A. Burns under the head of Inguinal resembling Crural Hernia, owing to malconformation of the Inguinal Canal, was also a Congenite Hernia, but very different from the above.

has been exposed by slitting up the Superficial Aponeurosis.

K, A Herniary Sac, containing a large quantity of the Omentum. From the deficiency of the Anterior side of the Canal, the Tumour in this person appears at the lower orifice of the Canal, just over the spot where the Iliac Vein passes over the brim of the Pelvis. The interlacing Fibres are distinctly seen binding the Pillars together, and narrowing the Hernial Sac.

L, The Anterior fillet of the upper Pillar of the Inguinal Canal, conjoined with a part of the superficial Aponeurosis of the external oblique, and forming a stricture about the Sac, nearly where the lower aperture of the Inguinal Canal ought naturally to have been placed.

M, The Omentum, brought into view by cutting away a part of Aponeurosis, and the Peritoneal Sac.

Of Ventral Hernia.

A Hernial Tumour appearing at any part of the belly, excepting at the natural Apertures in the Parietes of the Abdomen, has been called a Ventral Hernia.

This species is most common between the Recti Muscles of the Abdomen, and has been described by Hippocrates, under the name of Devulsio, Ruptura Ventris.

Sabatier has described a species of Ventral Hernia, which he met with very near to the Under Abdominal Aperture, occasioned " par un ecartement des fibres de ce muscle pres l'anneau."

Such Herniæ generally occasion but little pain, are readily reduced, and are rarely strangulated, the base of the Tumour being large.

The Tumour sometimes attains a very considerable size, containing a large portion of the Ileum, or Jejunum, with Omentum and Mesentery, and sometimes the Stomach.

I have met with several Ventral Herniæ in the course of the Linea Alba, or Linea Semilunaris, and in some cases, these Herniæ have appeared in succession.

Mr A. Burns informed me of a case, in which a patient had all the symptoms of Hernia, excepting a Tumour. On dissection, a small portion of Intestine was found, by the attending Surgeon, to have passed between the fibres of the Transversalis Muscle, forming a small Hernia between that and the internal oblique Muscle.

Most authors have imputed the Ventral Hernia to the relaxation of the muscular fibres of the Parietes of the Abdomen.

But as this kind of Hernia is often induced in young people by severe muscular exertion, as in lifting weights, leaping horses, dancing, and from violent vomiting; it appears probable, that it has been occasioned by a rupture of some of the muscular and tendi-

nous fibres, and more especially as it is the immediate consequence of muscular exertion: for there is no reason to conclude, that the unnatural size of the small openings, which give passage to the small Blood-vessels and Nerves of the parietes of the Abdomen, ever give passage to the contained Bowels; and more especially as there are no such Apertures for the Blood-vessels at the Linea Alba, at which the Bowels are most frequently protruded.

Such is the opinion which I formerly published respecting the most frequent cause of this kind of Hernia, and was much gratified by observing, that Mr A. Cooper and Mr Lawrence * entertain a similar opinion, and the latter gentleman detected the rupture of the Recti Muscles.

In some old people, we meet with large Tumours *in the belly*, owing to the weakness, or partial absorption of the Parietes, but such Tumours scarcely merit the appellation of Herniæ, for the Bowels are not protruded from their proper cavity.

This Hernia, according to Heister †, Barbette ‡, and Platner §, has been mistaken for an abscess, and indeed abscesses have sometimes given rise, according to Petit, to a Ventral Hernia‖.

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* Vid. second Edition of his Treatise on Ruptures, p. 442.

† Instit. Chirurg. p. 749.

‡ Chirurgia, cap. 7.

§ Institut. Chir. p. 449.

‖ A Ventral Hernia has sometimes been occasioned by a wound or blow upon the Abdomen.

Of Hernia of the Bladder of Urine, or Cystocele.

The Bladder of Urine, on account of its Ligaments, has been but rarely protruded; sometimes its lateral parts have passed through the Inguinal or Crural Apertures, or the under part of it forms an unnatural Tumour in the Perineum, or Vagina.

Notwithstanding the attachments of the Bladder of Urine, it sometimes happens, as in a case related by Mr KEATE *, that a considerable portion of the Bladder has been protruded.

The variable size of the Tumour is a striking feature of this Hernia.

When the Urine is retained, the Tumour acquires a large size; communicates, when pressed, a sense of fluctuation, and the bulk of it is suddenly diminished on discharging its contents; and when empty, the Tumour is small, and feels softer than other Herniæ.

The protruded Bladder is generally uncovered by a Hernial Sac, unless when the upper part of that organ has been displaced.

The protrusion of the Bladder is frequently followed by a paralysis of the muscular fibres of that organ; hence the patient cannot empty his Bladder unless he elevates, and at the same time presses upon it.

A part of the Omentum or Intestines may follow the displaced part of the Bladder of Urine, as it

* Vid. his Cases of Hydrocele, to which is subjoined a singular case of Hernia Vesicæ Urinariæ.

drags down after it the Peritoneum, and then nothing intervenes between the cavity of the Abdomen and protruded portion of the Bladder.

This Hernia has sometimes happened during the latter months of utero-gestation, or sometimes from a Prolapsus Uteri, of which my Father met with a striking example. In that case, the Vagina was inverted, and the mouth of the Uterus formed the under part of the Tumour, and the Urethra described a curve on the fore-part of the swelling. The Urine had been suppressed for several days; my Father passed the Catheter, and drew off five lbs. of urine.

The Bladder sometimes forms a Pudendal Hernia.

The earliest account of that kind of Hernia, is contained in the "Memoires de l'Acad. des Sciences," for the year 1713. To this case, another was afterward added by VERDIER. "Mais si la vessie dans l'etat de grossesse forme une Hernie, ce n'est pas toujours par les anneaux, ni meme par les arcades crurales: elle se glisse quelquefois sur un des cotes du vagin, et de l'Intestin Rectum, et pressée par la Matrice, elle force quelques unes des fibres des muscles releveurs de l'anus, et forme une Tumeur au Perinée un peu lateralement*." In MERY'S patient, who was a poor woman, who, during five or six months, had been unable to void her urine, unless with much difficulty, a Tumour was felt between the Vulva and the Rectum, but a little to the side of the Raphe. By pressing on the swelling, it

* Vid. Mem. de l'Acad. de Chir. Tom. II.

receded, while the urine flowed from the Urethra. In VERDIER'S patient, the Tumour was likewise seated in the Perineum, at the side of the Vulva. The complaint, which was attended with considerable inconvenience during pregnancy, disappeared after delivery.

During a second pregnancy, it returned, and increased to such a size as to occupy the whole of the Perineum.

But the history of this Hernia was still incomplete; for the subjects of the above cases were alive, and the situation of the Muscles and Blood-vessels of the Pelvis, in respect to the Hernia, and the causes of incarceration, had not been determined.

During the course of the winter 1808, Mr A. BURNS had an opportunity of dissecting the body of an old woman, with a Hernia of the above kind, which he described to me as follows: "Having exposed the contents of the Abdomen, and removed the small Intestines from the Pelvis, the Urinary Bladder was found stretched across the Pelvis, with its long diameter directed from side to side. Also in the centre of the Pelvis, it was so much depressed, that the upper surface of the Vagina was forced out between the Labia Pudendi. Laterally, the shoulder of the Bladder on each side was pulled out into processes, which were traced, descending like horns on each side of the Vagina. When the cavity of the Bladder was exposed by a transverse incision, it was clearly ascertained, that the protrusion had on both sides taken place

from that part of the Bladder below the angle of reflection of the Peritoneum. In this subject, of consequence, there was no Peritoneal Herniary Sac.

" By insinuating the finger into the Cyst on the right side, I found that it followed the direction of the lateral part of the Vagina, till at last it was felt lodged in the Labium Pudendi, very near to the junction of the Vulva with the Perineum. The sound portion of the Bladder was now separated from the protruded part, and a free dissection made of the Tumour. Had less been done, the principal features of this Hernia would have remained hid. The real site of the Tumour, its relation to the Vagina, to the Rectum, to the Obturator Artery, to the Obturator Internus Muscle, and to the Levator Ani, could only have been guessed at. The precise point where stricture would have taken place, could never have been satisfactorily ascertained. By removing, however, the Peritoneum from the Pelvis, and by detaching the Bladder from the protruded part, all these points were brought clearly to view, the seat and cause of incarceration is brought before the eye. The Tumour is seen slipping down between the Levator Ani, and Obturator Internus Muscles, pushing the Obturator vessels and Nerve against the bone, and itself closely embraced by the curved membranous origin of the Levator Ani; a fact which incontrovertibly proves, that had incarceration taken place, its seat would have been deep in the Pelvis. Even in this subject, where the Tumour is still reducible, there is a very evident narrowing at this

point. There is here from the bracing back of the bowels on the Obturator Muscle, a natural tendency to strangulation; and here a very slight encroachment would have produced complete stricture. The Tumour did not, as Mr VERDIER supposed, burst from between the fibres of the Levator Ani; it passed freely between that Muscle and the Obturator Internus. It therefore escapes from the Pelvis by a very small chink; so the neck of the Tumour must always be narrow: but from the looseness of the Cellular Membrane connecting the Muscles, and from the laxness of the texture of the Labium, it afterwards expands, and generally in the end forms a Florence flask-like Cyst.

"This knowledge ought to regulate our endeavours to return the protruded parts: it shows us, that from the pyriform figure of the Tumour, one may press, for an indefinite length of time, on that part of the swelling lodged in the Labium, without tending in any material degree to replace the prolapsed part. To replace the Cyst, we must, in the first instance, by pressure with one or two fingers in the Vagina, empty the Tumour of its contents; then, while the patient lies on the side on which the protrusion is placed, we endeavour, by regulated pressure in the direction of the Anterior Superior Spine of the Ilium, to push back the Cyst, which will be facilitated by gently pressing the Anus upward, and to the same side on which the Hernia is seated. By doing this, we shall at least relax

as much as possible, the curved membranous origin of the Levator Ani*."

* According to Mr Burns's desire, I have inserted the inferences which he drew from the above case: "When a cystic Pudendal Hernia has become strangulated, it is to be remembered that there is no peritoneal sac; and, before undertaking the operation, the urine is either to be expelled or drawn off from the protruded part of the Bladder. Having done this, an incision is next to be made through the skin and fat of the Labium, cutting cautiously till the protruded viscus be exposed. When this is done, if the tumour be on the left side, the fore and mid finger of the left hand are to be passed along the Vagina; now, by the forefinger of the right hand, a probe-pointed bistoury is to be conducted along the tumour, between it and the Levator Ani, till its point be carried higher than the ligamento-tendinous origin of that muscle. When the bistoury is fairly fixed on this, the stricturing point, its cutting edge looking towards the centre of the Pelvis, the surgeon is to pull to the right the Vagina and Bladder with the finger, which he has in the former; and while he does that with the left hand, he is, by retracting the right, to cut that portion of the Levator Muscle with which his knife is in contact. This is the plan of operating, which, in this species of Hernia, I have found, on the dead subject, to be more easily executed; and, I must add, that its performance is attended with some risk; for between the protruded and unprotruded portion of the Bladder, there is little interposed except the thin fillet of the Levator Ani; if, therefore, the bistoury be carried too far toward the centre of the Pelvis, we may injure the shoulder of the Bladder. Our chief dependence, indeed, for avoiding this, must be placed on turning the viscus aside by the fingers in the Vagina. Dangerous as it must always be to cut in the dark so deep in the Pelvis, I believe, from a review of the healthy and morbid anatomy of the parts concerned, the plan of operating which I have just proposed, will be found equally safe as any other which can be devised. When a part of the Bladder escapes

Meadows fculp.t

Calculi have sometimes been formed within the protruded portion of the Bladder; and BERTRANDI makes mention of a case, in which the orifice of the protruded Bladder was so much encrusted by calculous matter, that he had great difficulty in entering a probe into it: and sometimes a calculus is lodged at the constricted part of the Bladder.

Dr WALTER of Berlin, has described two uncommon species of Hernia, in the following paragraph:

"Penis, vesica urinaria et urachus. Rarissima est observatio, prægrandem adesse urachi Herniam. Ex puero duodecim annorum.

"Vesica urinaria viri triginta aliquot annorum; in hac observamus duas Hernias: prima supra ureteris sinistri in vesicam ingressum saccum rotundum format, cujus diameter quatuor pollices aequat; altera in urachum excurrit*."

EXPLANATION OF PLATE XI.

THIS engraving represents an inside view of a Hernia of the Bladder, which occurred to Mr A.

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from between the Levator Ani and the Obturator Internus, there is reason to believe that the Tumour will generally make its appearance in the Labium. This, however, is not uniformly the case. On the opposite side of this very subject it took a different route. After having passed a certain length between the Levator Ani and Obturator Internus Muscles, it dipped towards the Tuber Ischii, and, finally, following the course of the Obturator Internus Muscle, it passed from the Pelvis between the Sacro-sciatic ligaments."

* Vid. Mus. Anat. WALTERI, Vol. II. p. 270.

Burns of Glasgow, and of which the history has been given in pages 523, &c.

A, The Region of the Symphysis Pubis.

B, The Peritoneum turned aside, which covered the Anterior Iliac Artery, C, and the corresponding Vein D.

E, The Epigastric Artery, taking its rise from the Anterior Iliac Artery, C.

FF, Two small Crural Herniæ.

GG, The inside of the Bladder of Urine.

H, A part of the Bladder of Urine, which was protruded.

Of Internal Herniæ.

In a former page (371), I enumerated several species of Internal Herniæ.

The first has been already described, viz. where the displaced bowels are contained within the Inguinal Canal.

The second class of Internal Herniæ comprehends those which are by no means obvious during life, on account of the thickness of the investing parts.

Of Ischiatic Herniæ.

In the Ischiatic Herniæ, which are very rare, and probably, in many instances, connected with a malconformation of parts, the Bowels are protruded through the Sacro-Sciatic Aperture of the Pelvis.

The Tumour is generally of a small size, and its existence is not suspected during the patient's life, as in the cases related by BERTRANDI *, CAMPER †, and Mr ASTLEY COOPER ‡.

My Father met with a case nearly similar to that described by PAPEN §, which forms an exception to the above remark.

Having made mention of this kind of Hernia in a former page (380), I beg leave to refer the reader to it.

Of the Hernia Obturatoria.

By the Hernia Obturatoria, is to be understood, a protrusion of the Bowels through the Obturator Aperture.

This is also a rare kind of Hernia, and frequently discovered only after the patient's death, on account of the small size of the swelling, and its deep situation.

The Tumour is prevented from extending by the first and second heads of the Triceps, Gracilis, and Pectineus Muscles, under which it lies.

Of the Perineal Hernia.

The Perineal Hernia falls under the third class of Internal Herniæ; for, at the commencement of the

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* Vid. Mem. d'Acad de Chir. Tom. II. p. 2.

† Anat. Pathol. Lib. II. p. 17.

‡ Vid. Part II.

§ Vid. HALLER, Disput. Chir. Vol. III.

disease, there is no external Tumour*, and sometimes, as in the case which happened to Dr M'Laurin†, symptoms of strangulation occur, and the patient dies, though there exists no external Tumour.

But, in consequence of the duration of the disease, a Tumour frequently appears in the Perineum, on one side of the Raphe, the Bowels having passed (if the patient be a male), between the Rectum and Bladder, between the Levator Ani and Sphincter Muscle, or between the fibres of the Levator Ani; in the female, the protrusion takes place between the Bladder of Urine and the Vagina.

The Tumour, when internal, may be discovered from the Rectum; when external, it becomes more evident while the patient is standing, becomes less upon pressure, and upon the recumbent position. Sometimes this kind of Hernia is accompanied by bearing down pains, and has been mistaken for a Prolapsus Uteri.

The Intestines generally form the contents of the Hernia, and sometimes the Bladder of Urine; and hence there is some variety as to the symptoms.

The Bladder of Urine is always more or less affected by this kind of Hernia; as even when the Intestines have been protruded, it is pressed upon, and irritated by these.

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* Vid. Mr Astley Cooper's Plates.

† Vid. Denman's Midwifery.

Vid. also Smellie's Cases and Observations in Midwifery, in which two cases of this kind of Hernia are described in detail.

Of the Vaginal Hernia.

This Hernia, which is most common amongst women who have had several children, generally is perceived projecting into the upper and back part of the Vagina, and sometimes, according to SANDIFORT *, at the orifice of that Canal.

This Hernia, which becomes larger and tense in the erect, and disappears in the recumbent posture, bears a strong analogy to the Perineal Hernia; for in both, the protrusion takes its origin in the same situation.

The Intestines generally form the contents of the Tumour, and sometimes, though rarely, the Bladder of Urine; and as in the former case, though the Bladder be not protruded, it is affected from its vicinity to the Hernia.

The Bladder of Urine sometimes forms a prominent Tumour at the lateral or posterior part of the Vagina in virgins, and still more frequently in married women, when that Canal has been reduced to a state of relaxation by repeated pregnancies at short intervals.

As the Os Uteri is pushed forwards, and the Vagina is in part filled by the tumour, such a Hernia bears a strong resemblance to the retroverted Uterus.

In this case, upon introducing the finger into the

* Vid. Obs. Anat. Pathol. Lib. I. Cap. 4.

Vagina, a large fluctuating Tumour is found within it, which disappears upon pressure. The urine flows out by the Urethra, or upon the urine being drawn off by the Catheter, and then the superior part of the Vagina is felt flaccid.

In some cases, the projecting Bladder of Urine within the mouth of the Vagina, has been said to have proved an obstacle to delivery.

The membrane of the Vagina forms the external surface of the swelling.

Pudendal Intestinal Hernia.

This kind of Hernia also resembles the Vaginal, for the displaced parts pass along the surface of the Vagina, and protrude, as in the case of the Hernia above described, between the fibres of the Levator Ani Muscle; and the Tumour is situated in the middle of the Labium, and may be felt extending along the side of the Vagina, by an examination per Vaginam.

In the preceding pages, 523, &c. a Pudendal Hernia of the Bladder has been described.

Mr A. Burns has informed me, that since Mr A. Cooper's books on Herniæ were published, he has met with two examples of that species of Hernia in the living subject. In both cases, the bowels were reducible, and the diseases coincided, in every point, with Mr Cooper's description, except in regard to the position of the Tumour. In the cases examined by Mr Cooper, the Tumours were lodged between

the folds of the Labium, " above a line drawn from the orifice of the Vagina outwards." Whereas when Mr Burns's patients were standing, the Tumours appeared like pretty firm balls in the Labium, behind or below a line drawn from the orifice of the Vagina outwards.

Of Hernia occasioned by an unnatural elongation of the Omentum.

The last class of Internal Herniæ, originates from internal malconformation, by which stricture, sometimes amounting to strangulation, is made upon a part of the Intestinal Canal, in consequence of an unnatural Aperture in the Diaphragm, of malconformation of the Omentum, Mesentery, Mesocolon, or of an unnatural appendix to the Intestines.

In consequence of the unnatural length of the Omentum, it sometimes encircles the Intestines, and the degree of stricture thereby produced, proves in some cases a complete barrier to the course of the fæces, and produces great distention, inflammation, and strangulation of the Intestines.

I have seen five cases of this description, in three of which, the Intestinal Canal was constricted only at one place by the Omentum, but in the two others, the Intestinal Canal was constricted at three different places.

A sixth similar case was communicated to me by Dr James Anderson.

I have inserted a brief history of the appearances upon dissection in two of the cases.

The first was that of a young woman. The Omentum extended to the Pubes, and adhered, by preternatural short processes to the Ovaria and posterior part of the broad ligament of the Uterus.

A part of the Omentum, which was of a much darker colour than usual, being covered as by a lattice-work of vessels, passed downwards between the convolutions of the Ileum, and was fixed to the Spine.

The whole track of the Intestines, and more especially the Ileum, bore the marks of inflammation.

In this person there was a great tendency to the formation of these unnatural processes, for besides the unusual process of Omentum passing around the Intestine, there was also a vessel from the Mesentery, of the size of a small goose-quill, passing around, and constricting the Intestine, which was distended by dark-coloured blood, to which an oval-shaped body, of a deep purple colour, about the size of a dried bean, was attached.

I have made the more particular mention of this latter circumstance, as it seemed to me to afford an illustration of the manner in which these unnatural elongations of the Omentum (which do not in structure resemble the healthy Omentum), are formed; and that, in this case, the Intestines had not been protruded through an aperture in the Omentum.

In the second instance, the patient had been for

many years occasionally constipated, which at length amounted to such a pitch, as to induce inflammation of the Intestines, which proved fatal to him.

Upon examining the body, the Omentum, to which a very small quantity of fat was appended, was found covering the whole surface of the great and small Intestines, and was firmly fixed down to the Bladder of urine, by means of a number of short and firm processes, and also to the left side of the Colon, and to the Sigmoid Flexure of that bowel.

After tearing asunder the preternatural adhesions which the Omentum had contracted, it could not be turned up in the usual manner, on account of three different bands, which passed between the *different turns of the Ileum; these encircled the Intestines, and made considerable pressure on them.* The Intestines, above the constricted portion, were much dilated, whereas the portion beneath seemed somewhat less than usual.

The greater part of the Omentum and Intestinal Canal were of a leaden colour, and here and there of a chocolate colour; but the coats of the Intestine had not lost their usual firmness, and did not tear, even upon being rudely handled.

The vessels of the Villous Coat of the Ileum of the three portions, surrounded by the preternatural processes of the Omentum, were much distended by blood, and were covered by thin layers of coagulable Lymph.

My Father met with a case more than thirty years ago, in a case of Congenite Hernia on the right side, in which an unnatural process from the Omentum was the cause of strangulation. The Hernial Tumour was as large as a goose's egg, it was tense, and felt as if it contained a portion of Intestine, and also of Omentum.

The Testicle formed the lower and back part of the Tumour. All the usual methods were employed, with the view of removing the disorder, but in vain; an operation was performed by that excellent Surgeon, the late Mr Benjamin Bell.

The Intestines within the Sac, which were found of a dark colour, were readily replaced.

A part of the Omentum, which had attained an unnatural bulk, was found adhering to the Spermatic Cord above the Testicle, and to the Hernial Sac at the Under Abdominal Aperture, was cut off, as it could not be reduced.

The patient died thirty-eight hours after the operation.

On dissection, all the Intestines were found of a dark colour, and much distended with air. A part of the Ileum which had been within the Sac, was contracted, and thickened. The Omentum adhered to the Peritoneum, above the Under Abdominal Aperture, and a process of Omentum passed around some turns of the Ileum, and grew to the Mesentery, forming a complete circle around the displaced Intestines.

In cases such as the above, the cause of the strangulation being internal, it cannot be removed by dividing the Aperture through which the displaced portion of Intestine has passed, or by opening the neck of the Hernial Sac, and continues, even when the Bowels have been returned into the cavity of the Abdomen.

It merits mention, that the Ring formed by the Omentum, which embraces the Intestine, is, strictly speaking, rather a membrane attached to the Omentum, than a portion of it; it is more firm, and has no fat appended to it, and bears a greater resemblance to the Peritoneum than to the fatty Omentum.

Of Hernia through the Mesentery.

In this kind of Hernia, the displaced Intestines pass through an unnatural Aperture in the Mesentery, and are strangulated*.

Mr A. Cooper has published an engraving, in which the Intestines are represented as having passed between the layers of the Peritoneum, forming the Mesentery.

Both patients died in consequence of inflammation in the Bowels.

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* Vid. Plate I. fig. 1. in my Observations on Crural Hernia, which was taken from a case of that kind of Hernia, which occurred to Dr Rutherford.

Another variety of internal Hernia, which I have seen, is produced by the protrusion of the Villous and Cellular Coats of the Intestines, through the Muscular Coats, in the same manner as pouches are formed within the Bladder of Urine.

It sometimes happens, that a process from the Intestines passes around the Intestines, and proves a cause of strangulation.

In the remarkable case from which Plate XX. was taken, a process grew from the Ileum, which passed around, and so greatly compressed a portion of the small Intestines, as to prove the cause of death.

I have also seen all the symptoms of strangulation occasioned by the unnatural adhesion of the convolutions of the Ileum; which adhesion made considerable pressure upon, and confined a part of the Intestinal Canal.

My Father met with a case, in which a patient died, with all the symptoms of a strangulated Hernia, where the Caput Coli was inverted.

Upon dissection, the Intestines were found adhering to each other by means of Coagulable Lymph, and the Caput Coli was very much distended by fæces, and also inverted and fixed in that situation by unnatural adhesions.

To me it seems probable, that the distended and inverted Colon, was the source of the obstruction to the passage, through the Intestines.

APPENDIX.

Since the work was printed, I have been favoured by Mr Hammick, 1st Surgeon to the Naval Hospital Plymouth, with the following very important document, stating the number of patients who have received Trusses at that establishment, for the last nineteen years.

	Years.	Right.	Left.	Double.
"From Oct. 1792, to Oct.	1793	35	28	4
1793, - -	1794	54	47	3
1794, - -	1795	48	45	3
1795, - -	1796	34	32	4
1796, - -	1797	83	43	15
1797, - -	1798	58	45	7
1798, - -	1799	66	63	10
1799, - -	1800	95	57	12
1800, - -	1801	83	65	7
1801, - -	1802	54	43	5
1802, - -	1803	43	29	10
1803, - -	1804	125	95	27
1804, - -	1805	116	72	13
1805, - -	1806	113	75	14
1806, - -	1807	111	51	18
1807, - -	1808	11	6	1
1808, - -	1809	7	3	2
1809, - -	1810	8	5	2
1810, - -	1811	3	3	1
	Total,	1157	807	158

"The reason there is so small a number in the last four years is, that the Surgeons of ships now have trusses with them on board to supply the men of their respective ships.

"In nineteen years, only three cases of strangulated Hernia have been operated upon; and not one

man has died within these walls during that period, with a strangulated Hernia unoperated upon. This is a very important fact, as it proves that strangulated Herniæ are not so fatal, nor do they require the operation so frequently as has been imagined, and speaks more than volumes."

Mr H. adds, "that seamen, from their peculiar duties, as leaning over yards to furl sails, during which, the lower part of the Abdomen is much compressed, are exposed to the exciting causes of Herniæ, more than other classes of men."

Having seen no statement respecting the frequency of Hernia in Poland, it seems necessary to add the following extract, which Mr DYNELY was so polite as to translate.

Mr F. L. DE LA FONTAINE, in his Chirurgisch-Medicinische Abhandlungen Vershiedenen Inhalts Polen Betreffend, says, "Die Brüche sind bey dem abgehärteten arbeitenden Landmanne sehr selten: unter 2. 3. bis 400 wird kaum einer mit diesem Uebel behaftet zu finden seyn; da unter den chorsingenden Geistlichen, dem wohllebenden Adel und Bürgerstande diese Krankheit ziemlich allgemein ist."

"Herniæ are very rare amongst the hardy labouring-people in the country, so that in two, three, or even 400, not more than one will be found ruptured; while amongst the choristers in churches, and the luxurious nobility, and citizens, this complaint is common enough."

Plate XX.

I. Stewart sculp.t

EXPLANATION OF PLATE XX.

A and B, Represent a Processus Cæcus, which passed and strangulated the portion of Intestine, marked by the letters DDD.

C, The Ligament, C, unites the above-mentioned unusual process to the Mesentery.

Of Diaphragmatic Hernia.

The Diaphragmatic Hernia is the consequence of an unnatural Aperture in the Diaphragm, through which the Ileum or Colon passes. An unnatural Aperture in the Diaphragm may be the consequence of a wound, or of original malconformation. In the former, the edges of the unnatural Aperture are irregular, but in the latter, smooth.

Mr A. Cooper, when describing this kind of Hernia, has observed, " some of these Herniæ are included in Sacs, others are not; those which arise from gradual protrusion at the natural Apertures, have Sacs formed by the Peritoneum and Pleura; but of those arising from malconformation, some are contained in Sacs, and others not, whilst those which arise from laceration are always without Sacs.

" The Tumour," he has added, " may be covered by a double Sac, if the Pleura and Peritoneum are not, like the Diaphragm, imperfectly formed."

In some cases, the unnatural Aperture in the Diaphragm is large; and a considerable share of the contents of the Abdomen pass into the chest, and the child dies in a short time.

Ranby has described the case of a child who died when two months old, (see the London Philosophical Transactions); the Stomach, Ileum, and Cæcum, were found in the left cavity of the Chest.

It is remarkable that some persons have lived with an unnatural Aperture in the Diaphragm for several years, which is probably to be imputed to the Aperture being of small size; but upon a violent effort being made, then a part of the Intestine has been forced through the unnatural opening in the Diaphragm, and has been strangulated.

The subjoined case *, which was communicated to

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* "The patient, a young woman, twenty-two years of age, had been occasionally subject, during the greater part of her life, to pain in the left side, under the false ribs. This was generally succeeded by pains, throughout the whole Belly, resembling Colic pains, and was attended with some degree of costiveness.

"These complaints commonly wore off in a few days, and she was not subject to them at the period of Menstruation. Having danced violently on Saturday evening, she was seized on the Sunday morning, in the manner below described. In the afternoon, she was seized with a violent vomiting, and with excruciating pain in the side and belly, which lasted during the whole night. A clyster was given about ten o'clock, which procured a considerable discharge of fæces, but without any relief.

"She was never observed to have any shortness, or difficulty in breathing, and lay alike well on both sides.

my Father, by Dr PATERSON, of Ayr, by letter, dated Ayr 1793, seems to me of the above description.

"The body was opened the following morning, and although only twenty-two hours after death, it was unusually putrid.

"The bowels were much distended with air, and the drink she had swallowed was effused into the Cavity of the Abdomen.

"This I found to arise from an opening through the Coats of the Stomach, nearly in the middle of its great curvature.

"On examining the Intestines, I found a large portion of the Colon had passed through an opening in the middle of the left side of the Diaphragm, into the cavity of the Thorax; and lay behind the Heart and Lungs.

"This Tumour exceeded the size of a person's fist, and appeared to be strangulated; for all the blood-vessels were turgid, as if they had been injected, and the Gut was with difficulty drawn back into the cavity of the Abdomen.

"On examining the opening through the Diaphragm, I found it surrounded by a callous Ring, and to have every appearance of having been of long standing, or more probably an original defect.

"A thin Pellucid Membrane was connected with part of the edge of the Ring, and a sort of process from this Membrane extended along the Tumour, into the cavity of the Thorax. On examining, it appeared that the bowels had not been forced through the Diaphragm, at the side of the Oesophagus, the Vena Cava Inferior, or Aorta, but through a preternatural Aperture in the Diaphragm, into the left side of the Thorax."

From the symptoms which preceded the death of this woman, and the history of the appearances discovered upon dissection, it seems probable, that the violent exercise she had taken, had forced more of the Colon through the preternatural Aperture in the Diaphragm, which brought on strangulation.

The Aperture was of an oval shape, and, though now considerably shrunk, from having been dried, still measures two inches and a half in length, and an inch and a half in breadth.

CHAPTER IV.

OF MALCONFORMATIONS OF THE LOWER PART OF THE ALIMENTARY CANAL

In the preceding Chapter, I have had occasion to make mention of several of those Malconformations of the Alimentary Canal, which occasion stricture of the Intestinal Canal.

To enter at large into a description of the different kinds of monstrosity which have been observed in the structure of the Mouth, Nose, and Pharynx, would require a great number of pages; I therefore propose to limit my observations to the description of Malconformation of the Rectum, of which there are the following varieties.

The first and most common Malconformation, is that in which the Rectum is covered by the common teguments, or by a membrane of considerable thickness.

In some such cases, a swelling is perceptible,

where the Rectum should form the Anus, which feels soft when pressed, and on plunging a lancet into the prominent Tumour, the Meconium is discharged.

This unnatural membrane is sometimes so thin, that the colour of the Meconium shining through it is distinguishable; but sometimes it is hard and thick, with a livid mark in its centre.

There is a variety of this Malconformation mentioned by Dr. Wrisberg, in which the Rectum terminated in a kind of Cul de Sac.

In the second species, the membrane which obstructs the Rectum, instead of being situated externally, is internal, and may be felt by introducing the finger into the Rectum, especially when the child cries, as it yields to the impulse of the liquid Meconium contained within the Rectum.

This Membrane is in some examples thin, but in others of considerable thickness, and has been said by Trioen *, to be in some instances as hard as horn.

This cause of obstruction cannot in all instances be removed; as though a perforation be made through the obstructing Membrane, the Rectum remains constricted.

The third species of Malconformation, is by no means so frequent as the first, as it proceeds from the unnatural contraction of the Rectum.

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* Vid. Obs. Med. Chir. p. 60.

I have seen the Rectum contracted to one-third of its natural diameter, so that the Meconium passed with great difficulty through it, or not at all: and the child dies in consequence of the accumulation of the excrement within the Intestines.

This Malconformation may in some cases be removed, by dilating the contracted Rectum by a Bougie; and it is necessary to use the Bougie for a considerable time, lest the contraction should not be completely removed, or should return.

In some cases, the Rectum has been completely obliterated, and its opposite sides have been united.

In some such cases, the Anus seems exteriorly well formed, but in others, there is no appearance of an Anus.

Jessen has related a very marked case of the above description. A girl was born with the Anus well formed exteriorly. On introducing a probe into the opening, a great resistance was felt. A puncture was made, which did not procure an evacuation of the Meconium.

The child died sixteen days after its birth. On opening the body, we are informed, "Rectum intestinum bis lateribus concreverat, bis orbiculari intersepiebatur membrana*."

In the fourth species, the Rectum terminates in the Bladder of Urine, Urethra, Vagina, or Womb, or

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* Vid. Schenckii, Obs. Med. Lib. III.

sometimes there is one opening into the Bladder, and another into the Vagina.

In the Museum of Edinburgh, there are three instances of this description, which proved fatal to the children in a few days; the Rectum, which was so much contracted as to prevent the free passage to the Meconium, opened into the lower part of the Bladder.

But in a case related by FLAJANI*, a child with such a Malconformation lived for three months, during which the Meconium was voided along with the Urine.

On opening the body, the Colon, and the greater part of the Intestines, appeared very much distended, and filled with solid excrements. The Rectum was three inches in length, and ended in a Canal four inches long, which passed under the Prostate Gland, and opened into the membranous part of the Urethra. At the place of the insertion of the Canal, there was a cherry-stone, which the child had swallowed, and which had prevented the passage of the excrement through the Urethra.

Fifth, The Rectum, in a few very rare cases, has terminated in the Vagina, and the fæces are discharged by the Vagina.

The opening into the Vagina is commonly so

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* Vid. FLAJANI, Osserv. de Chirurg. Tom. IV.

much contracted, that the child lives only for a few days, on account of the retention of the fæces. But some have lived for some years.

Van Swieten* has related the history of a young woman who had such a Malconformation.

Benivenius† has described the case of a woman, who discharged her fæces by the Vagina for sixteen years.

Sixth, The Rectum is sometimes entirely awanting, and the Colon is closed at its lower extremity, and ends in a blind Sac‡.

In some such cases, we observe a mark of Anus, but in others no Anus.

In some cases, the Intestines open upon some part of the Parietes of the Abdomen, and sometimes at the Navel.

Mery has described a case, in which there was an Aperture at the Navel, in which the Colon terminated §.

Cases have been described by Littre and Petit, where the Colon and Rectum were wanting: It has been proposed in this case by Van Swieten, where an attempt to form an Artificial Anus has failed, to open

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* Vid. Comment in Boerhaave, App. 1340.

† Vid. Obs. Med. Cap. 86.

‡ Vid. Ruysch, Adver. Anat. Decad. II. p. 45; also Jamieson, Edinb. Med. Essays, Vol. IV.

§ Vid. Hist. de L'Acad. des Scien. An. 1700, p. 40.

the Abdomen, in order to procure a passage for the fæces. But much danger must attend such an operation, besides the Surgeon is without a guide to direct him.

Sometimes the Colon ends in a kind of blind Sac, about an inch from the Rectum, and the Rectum sometimes also forms a blind Sac, which is quite distinct, and unconnected with the Colon.

A case of this kind has been related in the first Vol. of the Memoirs of the Academy of Surgery, in which the patient was cured by the introduction of a Trocar, which reached the place the Meconium had been accumulated.

Lieutaud has described a case, where the Rectum was entirely wanting, and in which the extremity of the Colon was much contracted, and as if bound by ac ord.

Seventh, Mr De la Faye * has described two cases in which the Anus was not shut up; there was an opening in the middle of the Os Sacrum, which was capable of admitting the finger. In one of the children, a portion of the Intestines passed through this opening, and formed a kind of Hernia.

Eighth, There is still another Malconformation which has thus been described by Mr Burns †. "The Rectum, instead of terminating at the usual

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* Vid. his Principes de Chirurg.

† Vid. Edinb. Med. and Surg. Journal, Vol. I. p. 137.

place, perforated the posterior wall of the Vagina; then, occupying the Canal of the Vagina, it passed through the Vulva, and projected about an inch beyond the Labia Pudendi, bearing a distinct resemblance to an imperfectly formed Penis. It was of considerable size, possessing a writhing motion, and freely discharged meconium by an orifice situated at its apex."

It does not seem necessary to enumerate the concomitant symptoms of these different Malconformations.

The Prognosis is very unfavourable, excepting where the Anus is shut merely by a Membrane, which is to be perforated where there is a sense of fluctuation, and where it is transparent, and where the colour of the Meconium is distinguished through it.

CHAPTER V.

OF WORMS WHICH INFEST THE HUMAN ALIMENTARY CANAL.

On account of the great length of Chapter III, I am under the necessity of giving but a very general and imperfect account of those Worms which are proper to the Human Alimentary Canal; and this circumstance I do not regret, as this branch of Natural History has been very highly cultivated by Tyson *, Redi †, Clerici ‡, Pallas ‖, Fyshe Pal-

* Phil. Trans. 1683.

† Redi Franc. Osservazioni intorno agli animali viventi, che si trovano negli animali viventi; Firenze 1684.

‡ Clerici Daniel. Historia naturalis et medica latorum lumbricorum intra hominem, et alia animalia nascentium ex variis Auctoribus, et propriis observationibus, &c. Genevæ, 1715.

‖ Pallas, Dissert. de infestis viventibus intra viventia; Lugduni Batavorum, 1760.

MER *, ANDRY †, WERNER ‡, GOEZE §, BLOCH ‖, BRERA ¶, RUDOLPHI **, CARSLYLE ††, and JOERDENS ‡‡.

There are several different species of Worms which are proper to the Human Alimentary Canal, and which are capable of living within it, viz. the Teniæ or Tape Worms, the Ascaris Lumbricoides, or long round Worm, and the Ascaris Vermicularis, or short round Worm.

The Trichuris, and one or two other species, were unknown to the antients.

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* Tentamen Med. Inaugurale De Vermibus Intestinorum; Edinburgi, 1766.

† Traite de la generation des Vers. 3e edit.

‡ WERNER D. E. F. Vermium intestinalium, praesertim tæniæ humanæ brevis expositio; Lipsiæ 1782. Continuatio prima, secunda, et tertia curante, I. L. FISCHER, Lipsiæ 1782, 1786, 1788, 8vo.

§ GOEZE I. A. E. Versuch einer Naturgeschichte der Eingeweidewürmer thierischer Koerper; Leipsig, 1787.

‖ BLOCH Traité de la génération des vers des Intestins, et des vermifuges; Strasbourg, 1788.

¶ BRERA, Lezioni Medico-Practiche sopra I Principali Vermi del Corpo umano vivente e le così dette Malattie Verminose.—The figures of the Worms appended to this book, are by far the best which I have seen, and were drawn and engraved by ANDERLONI.

** Entozoorum, sive Vermium, Intestinalium Historia Naturalis, auct. CAROLO ASMUNDO RUDOLPHI, 3 Vols.

†† Linnean Trans.

‡‡ JOERDENS J. H. Entomologie und Helminthologie des menschlichen Koerpers; III. T. Hof. 1801, 1802, fol.

TÆNIÆ.

Several species of Tænia or Tape-worm, are peculiar to the human body.

Before proceeding to the description of the species, it may be proper to make some general remarks on the anatomical structure of the genus, which, although chiefly drawn from the examination of Tænia Solium, may be considered as applicable to all the species.

Anatomical Structure.

This animal is covered by an elastic and porous membrane, which, when examined by a microscope, seems smeared with a tenacious liquid, which exudes through the pores.

Under the membrane, some scattering fibres of a white colour are seen, the external of which are fixed into the inferior margin of each joint, and are disposed in a longitudinal manner; the inner set of fibres following a transverse course.

The Alimentary Canal, which takes its rise from the mouth, divides into two distinct Canals, which pass along the margins of the joints: and in the last joint, these Canals are impervious.

Besides these longitudinal marginal tubes, there are transverse Canals which pass across the inferior margin of each joint, and communicate with the longitudinal Canals.

These Canals were first injected by Ernest *.

Besides the above Canals, there is a pretty large Canal in the centre of each joint, (which was injected with quicksilver by my Father, and which has been particularly described by Dr F. Palmer, in his Thesis), which divides somewhat like a tree into a number of small lateral branches, which communicate with the lateral oscula, by small openings.

This system of vessels is generally filled by a white fluid, and has hence been supposed to be subservient to the generation of the animal, and, on account of the course of its smaller branches, has been called the Arborescent Ovaria.

All the species of Tæniæ are said to be Hermaphrodite.

Knots have been frequently observed in the Worm, which has led to the supposition, that as two pairs of the Oscula were in contact, the Worm was in a state of copulation.

This Worm consists of a head, a chain of articulations, and a tail formed of a round joint; these articulations are quadrangular.

The head is placed at the smaller, and the tail, which has an oval termination, at the larger extremity, of the worm. There are some who do not admit that the terms Head and Tail are correct; because each joint has its proper vessels, and is

* Vid. Haller, Disput. Med. Vol. III.

probably a separate animal, and capable of existing; independently of the other joints.

The head is placed upon a sort of neck or contracted part of the worm, and when strictly examined by the aid of a microscope, seems somewhat of a square shape. In it there are five apertures; the one in the centre, which is circular, is the mouth of the animal, and is surrounded by a double margin, and a number of rays, which describe small portions of a circle, between which, there are little projecting substances, which probably serve the purpose of tentacula, for fixing the orifice of the mouth. There are four oval-shaped apertures placed near to the angles of the square-shaped head.

Species of Tænia.

Instead of adopting the arrangements of any of the authors mentioned in page 549 and 550, I have resorted to nature, and selected from the Museum of the University of Edinburgh, those specimens of this kind of worm, in which the different characters were most distinctly marked. From a careful examination of these, my ingenious friend and pupil, Mr Leach, who is distinguished for his accurate knowledge of Entomology, drew out the following new specific characters *:

* Very elegant drawings of these three species of Tæniæ have been lately made by that correct artist, Mr P. Syme of Edinburgh, from which, had there been time, I should have subjoined engravings.

1. Tænia Solium. Articulis quadratis, elongato aut transverso-quadratis; osculis pone medium insertis. *Leach*, MS.

Tænia Solium.—Linn. Syst. Nat. ed. XII. 1323. *Faun. Suec.* 2264.

Tænia Osculis Marginalibus. Hooper *in Mem. Med. Soc. Lond.* Tom. V. p. 257. *Figura pessima.*

Tænia Elongata.—Herman, *Mem. Helminth.* hujus varietas.

Habitat in *Hominis Europæi*, intestinis frequentissimè.

This species, which is by far the most common, may be distinguished from all others inhabiting the human body, by the situation of its mouth, which is invariably placed behind the middle of the lateral margin. The mouth is sometimes placed on the right, and sometimes the left side indifferently. The form of the Ovarium affords no specific character, and is therefore omitted in this description. This worm is generally several feet, nay, even yards long, and is seldom passed entire; single joints are often evacuated by stool, and were formerly supposed to be a distinct genus of worms, and sometimes called *gourd-worms, Vermes cucurbitini.*

2. T. Dentata. Articulis brevibus, transverso-quadratis, postice marginatis; osculis medio insertis; margine posteriori dilatato; ovariis obscuris. *Leach*, MS.

Tænia Dentata, capite acuminate sessili, articulis transversè striatis, omnibus dilatatis, brevioribus; osculo in marginis lateralis utriusque medio elatiore. *Batsch, Bon, Gmelin*, 3073.

Habitat ——— *Mus. Monro.*

3. T. Lata. Articulis brevissimis, medio nodosis, postice marginatis; osculis prominulis medio insertis. *Leach*, MS.

Tænia Lata, candida, articulis brevissimis, medio nodosis; osculis solitariis. *Linn. Syst. Nat.* XII. 1324.
Habitat in hominis intestinis in Brittannia rarissime; in Russia et Helvetia frequentior.

These three species have the osculæ in the margin of the segments.

The last must not be confounded with the *Tænia Lata Osculis Superficialibus of* Hooper, in the Memoirs of the Medical Society of London, which certainly belongs to another genus, and is not, as he considered it, the *Tænia Lata* of Linnæus.

A species, under the name of *Tænia Vulgaris*, is noticed by Linnæus, as frequently occurring in Sweden, having two oscula on each joint; but as such has never come under my inspection, I can only quote the words of Linnæus: "Habitat in hominum intestinis, Suecia vulgatior, pertinacissimè infixa, ut violentioribus etiam remediis resistat; tenuis, laxa, quasi membranacea, Solio tenacior, vivens lactescens subpellucida, 10—16 pedes longa, et fine latiore ultra 4 et ½ lineas lata, articulis nunc quadratis nunc paulo magis oblongis, medio secundum longitudinem subtiliter striatis, ad latera transversè rugosis, ovariis florum corollam referentibus."

Having finished our account of the Tæniæ, we proceed to that of the Ascarides or Round Worms.

Round Worms.

There are three species of Round Worms: the *Ascaris Vermicularis*, *Ascaris Lumbricoides*, and *Trichuris Hominis*.

Ascaris Vermicularis.

Ascarides, when recently discharged, are nearly transparent.

This is the smallest, and most common species of Worm, and it is found generally in the Rectum. They are about half an inch in length, and divided into three parts. The head, in which three vesicles may be observed, with an aperture in the middle, is obtuse, and the tail ends in a sharp point.

This Worm has a distinct cuticle, cutis vera, and annular muscles.

The male seems to have only an Œsophagus, Stomach, and Intestines. The Stomach is a round bag, situated at the sides of the Œsophagus; this, according to GOEZE, constitutes a distinguishing character of the species.

The male organs of generation have not as yet been detected.

In the female, the apparatus for generation is visible. It begins as a slender tube, from a small opening, which is situated near the middle of the body; it gradually becomes larger, and surrounds the Intestinal Canal.

The Uterus is not bifurcated as in the Ascaris Lumbricoides; and its end is as large as any other part of it.

Ascaris Lumbricoides.

This Worm has generally been called Lumbricus. It was formerly supposed to be the same as the Earth-Worm, but it is very distinct.

It has a round body, and is generally from six to fifteen inches in length.

The smallest are whitish, and almost transparent, when examined soon after they have been passed; the larger are of a greenish-yellow colour.

They are very prone to putrefaction; the largest sooner putrify than the smaller. I have seen the largest burst in the course of a day or two after being voided.

The head is divided into three lobes, which are joined at their bases, betwixt which the mouth of the animal, which is of a triangular form, is placed. The Anus of the animal opens a little way from the extremity of the Worm, upon the under surface of the Worm, by a curved fissure.

The body has a rugose appearance, and there are four lines placed nearly at equal distances, which pass along the animal; two of these are much more apparent than the other, from being much broader.

By these lines, fibres, probably circular Muscles,

are intersected in such a manner, that each consists of two semicircular portions.

Anatomical Structure.

The animal has a strong, thin, elastic cuticle; the true skin is also elastic and transparent, and thicker than the former.

The Muscles, which are seen through the skin, do not surround the Worm, but are, according to Dr Hooper, two distinct sets of Muscles which act in opposition to each other; and each of the two longitudinal lines which extend from the head to the tail of the Worm, are composed of two distinct tendons, which serve for the attachment of the semilunar Muscles, which cover the whole of the Worm.

The cuticle, and true skin, are so transparent, that I have been able to distinguish the sex of the animal through these.

The Abdomen, which is lined by a fine membrane, which may be called Peritoneum, contains a transparent fluid, the Intestinal Tube, and an apparatus which is subservient to generation.

The Œsophagus, at its beginning, is small; it continues increasing in size. In the Abdomen, where it may be called Stomach or Intestinal Canal, it is capable of receiving a common-sized surgeon's probe; and about a quarter of an inch from the anus, it becomes narrower and straighter.

The Alimentary Tube is filled by greenish matter.

Some have supposed this Worm to be Hermaphrodite; but the sexes generally appear distinct.

I have remarked, that the females are larger, and more numerous than the males; and are generally in the proportion of four or five to one.

The parts of generation begin, or rather terminate, near the middle of the Worm, by a slender tube, which opens about the middle of the animal.

This tube soon becomes larger, it is then called Uterus; it divides into two Canals, which are considerably larger than the Uterus, then suddenly diminishes in size, and at last terminates in a number of small opaque threads, which float in the lowest part of the belly, and embrace the Intestines.

These smallest floating tubes are never empty, but are filled with an opaque fluid, in which there are a number of globular bodies floating.

In the male, the small tubes lead to a larger tortuous Canal, which may be called Vesicula Seminalis, which is rather more than an inch long, is unequal in its diameter, and follows somewhat of a tortuous course, and to the extremity of this, a conical shaped body, which may be called Penis, is connected by its base.

Some authors have supposed, that these Worms are viviparous; which appearance is produced by a part of the appendages of the Uterus having burst through the integuments of the animal.

As a proof that they are oviparous, I may add, that Ovula, in all respects similar to those found within the Uterus, have been detected in the Mucus surrounding the Intestines.

Some have supposed this Worm to be Hermaphrodite.

Trichuris Hominis.

This species is more rare than any of the above Worms. It was described, and shown by my Father, in his lectures in 1794, as an Intestinal Worm.

The body is about an inch long, and it has a filiform tail, about one inch and a-half in length.

Different authors vary in their opinions respecting the anatomy of the Worm. According to some, the animal has a proboscis, which it can eject at pleasure; according to Goeze, that is the Penis of the animal.

The Stomach and Intestines form a long Canal, which proceeds from the head to the extremity of the Worm, and is largest at its beginning; is much smaller at the tail of the animal.

The Ovarium, which frequently contains Ovula, and a limpid fluid, is a convoluted Canal, and similar to that of the female Ascaris Vermicularis.

Besides the species of Worms already treated of,

others of a very different description have been occasionally discharged by stool. I allude, in particular, to Caterpillars, or the Larvæ of Insects.*

Of the Symptoms of Worms.

Worms lodged within the Alimentary Canal always derange its functions more or less; hence those afflicted by them suffer from epidemic headach†, tinnitus, uneasy sensations in the Stomach, loss of appetite, or sometimes a voracious appetite ‡,

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* I sent, for examination, several specimens of them to Mr Leach, who favoured me with the subjoined report.

"They are all the Larvæ of insects, as follow:

"No 1, The ova of the Musca Vomitoria—My friend Donovan informed me, that he had seen the Larva of this insect in the intestines of a body (in Windmill Street), in a state of putrefaction. The eggs most probably were deposited at the mouth, or anus, and the Larvæ had found their way thither on their hatching, which soon happens.

"Nos. 2, 3, and 4, Larvæ of three unknown species of Coleopterous insects. No. III. is figured in the Medical Journal, Vol. VIII. p. 48. fig. 8. I am pretty certain, that it is what the farmer terms the Wire-Worm. Of what insect it is the Larva will soon be made known, as Sir J. Banks, at this time, is breeding a great many, in order to ascertain this important fact.

"Nos. 5, and 7, The Larvæ of Papilio Brassicæ, or some species much allied to it.

"No. 6. Pupa of some musca.—Species unknown to me."

† Vid. Sauvages, Class III. Gen. xxiii.

‡ Vid. Ephem. German. Dec. 11. An. 6, Obs. 33.

nausea, sometimes vomiting, flatulence, fœtid breath, tenesmus, griping, costiveness, sometimes purging, and discharge slimy or bloody stools, and become much emaciated. Some patients, after labouring under very acute pain in the belly, are attacked by an inflammation, which is followed by erosion of the Coats of the Intestines, and the worm escapes into the cavity of the Abdomen, or makes its way through its parietes.

Besides the above symptoms, sudden flushing of the face, itching, and sometimes a trickling of blood from the nose*, grinding of the teeth, and talking during sleep, and cough, are the concomitants of Worms †; and we sometimes also observe, lethargy, chorea ‡, catalepsy §, epilepsy, tetanus ‖, dilatation of the pupil, and other symptoms, which bear a strong resemblance to those of Hydrocephalus Acutus.

There are many authors who have enumerated certain symptoms as being peculiar to the Tænia, Ascaris and Trichuris, &c.; but I suspect, with the exception of the Ascaris Vermicularis (which creates uneasiness, violent heat, and itching at the Anus), we have not yet arrived at such a pitch of accuracy

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* Vid. Baglivi, Praxis Med. Lib. I.
† Vid. Friend, Hist. Phys. Vol. II.
‡ Vid. Ephem. German. An. 5, Dec. 7, Append.
§ Vid. Barrere, Obs. Anat. p. 167.
‖ Vid. Sauvages, Class XI. Gen. xxiv.

in the diagnosis, as to be capable of forming an accurate opinion respecting the kind of worm within the intestines.

CONCLUSION.

The attentive reader may possibly have observed, that in preparing the preceding account of the Morbid Anatomy of the Alimentary Canal, I have, with a very few exceptions, aspired merely to be the faithful recorder of facts, being fully persuaded that in science, as in architecture, it is necessary to collect materials before we proceed to combine them.

I had no preconceived opinion to support, no favourite hypothesis to influence my researches, or to induce me to disguise appearances, and bend them to the service of a system.

In the infancy of any particular branch of Medical Science, as in other cases of a similar kind, it is sufficient to examine Nature, to collect the phenomena which she exhibits, to note the results of the changes and derangements occasioned by the class of diseases subjected to investigation, and to estimate the relative effects of the different methods of treatment which have been adopted.

The merit of labours like these, may appear to

some persons small, but their importance will be properly estimated by physicians and surgeons of experience. They form the basis of discovery, and are an unerring guide to just principles of practice.

When the facts relative to an order of diseases, and the known modes of cure are fully ascertained, it may be permitted to the philosophical inquirer to begin the process of generalization, and to draw the ultimate conclusions which the knowledge thus acquired may seem to warrant. This is the order of science, and the only method of procedure from which may be expected any substantial or useful improvement.

To expatiate on the necessity or the advantage of an accurate acquaintance with the diseases described in the preceding work, would be undoubtedly superfluous, after the observations which have been made in the Introduction. But it deserves to be submitted to the serious consideration of the Medical Student, that we are not entitled to form our estimate of the importance and value of a particular department of the healing art, from its state at the period in which we live, or from the direct aids which it furnishes, to remedy or to alleviate the diseases of mankind.

Every addition to our knowledge concerning the origin, the progress, the external symptoms, and other concomitants of disease, is an instrument of still further discovery, and a source of power to the

skilful practitioner; at once purifying and extending his vision; directing him in the process of examining his patients; enabling him to detect in its seat the latent cause of the evil, to which he is called to minister; and awakening his ingenuity to disarm or oppose its malignant influence, by exciting in the system a new series of action, and applying its strength to work out its deliverance.

At the same time it ought to be remembered, that it is not of small avail to learn the reasons of the failure of the different attempts which have been made to remove the cause, or obviate the effects of organic derangement; as this knowledge may suggest new and improved methods of treatment, better adapted to the nature of the malady.

Even in those more painful cases, in which there is no hope of an ultimate cure, such knowledge may still be valuable in directing us to the means of soothing and sustaining the patient in his lingering conflict, and of giving him all the relief of which his condition is susceptible.

Reflections like these are not ill calculated to rouse the industry and ambition of those who are engaged in medical pursuits, and to determine them to the vigorous cultivation of Morbid Anatomy, from which as yet we know not all the benefits that our successors are appointed to derive.

These, I may repeat, were the chief inducements to my own exertions; for, to adopt the language of

Mr Burke, "I never should have taken the pains to digest my observations, much less should I have ventured to publish them, if I was not convinced, that nothing tends more to the corruption of science than to suffer it to stagnate."

Of the defects, as a literary production, of this treatise, which I deliver to the public with the greatest diffidence, no one can be more deeply sensible than myself. I am aware of its imperfections in regard to matter, arrangement, and style; and if I had not presumed to indulge the hope, that it might be of some use to the profession, I should not have thought, for some years to come, of appearing before the tribunal of criticism, in the capacity of an Author, being not unwilling to flatter myself, that if I had delayed publication for some time, the work might have been less liable to the severity of criticism.

But the following reasons have made me prefer an early to a more correct or finished publication.

If the facts and observations contained in the preceding pages shall be found, as I hope they may be, an addition and improvement to the healing art, or lead to such improvement, the sooner they are delivered to the public, the more likely are they to do good.

Another consideration, though more strictly personal, to myself, will, I trust, be allowed to be a laudable one. As a Professor of this University, I am anxious to convince the public, and especially

those friends and patrons who placed me in that honourable station, that I have not been inattentive to the obligations which it imposed on me; and that in this instance, as in many others, I have been ambitious of treading, though with unequal powers, in the footsteps of my Father and Grandfather, who, for many years, filled the chair I now hold, with credit to themselves, and advantage to their country.

THE END.

ERRATA.

Page 4. line 19, *for* take their run, *read* take their origin.
—— 7, —— 21, *for* a permanent but in others, *read* a permanent though in others
—— 8, —— 28, *for* attain an unnatural, *read* acquire an unnatural
—— 9, —— 18, *for* Stomach Intestines, *read* Stomach and Intestines
—— —, —— 29, *for* that as far as I, *read* so far as I
—— 10, —— 8, *after* TYMPANITES *insert* INTESTINALIS
—— 13, —— 6, *for* the distention, *read* from the distention
—— —, —— 22, *dele* the word when
—— 17, —— 5, *for* so as not to press, *read* so as to press
—— 24, —— 15, *for* cut *read* out
—— 33, —— 10, *for* are twelve *read* were twelve
—— 50, —— 12, *for* as in the subjoined, *read* appears by the subjoined
—— 56, —— 21, *for* R. Mannæ iij, *read* Mannæ ʒij
—— 60, —— 3, *dele* the word strong
—— —, —— 13, *for* direcly *read* directly
—— 88, —— 20, *for* drain off *read* draw off
—— 98, —— 15, *for* ultissimum *read* utilissimum
—— 108, —— 1, *instead of* which is included between the Pharynx and Rectum, *read* between the superior part of the Pharynx, and termination of the Rectum.
—— 111, —— 17, *after* Ossification *insert* Hydatids
—— 158, —— 20, *for* vcisid *read* viscid
—— 216, —— 4, *add, after* same, time
—— 298, —— 19, *dele the words* by vomiting
—— 321, —— 20, *instead of* push inwardly, *read* press inwardly
—— 359, —— 21 *instead of* Intine *read* Intestine

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